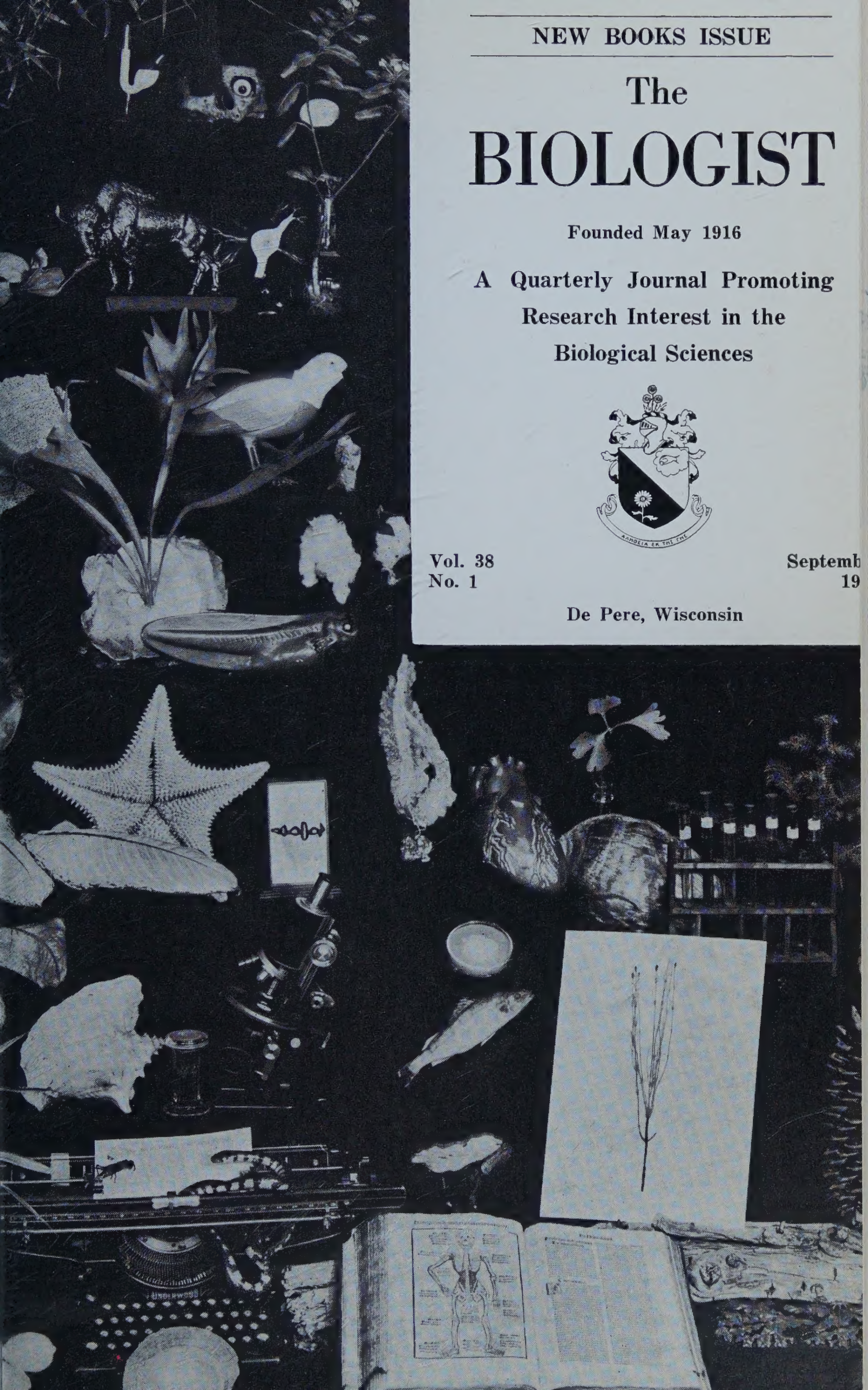

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THE BIOLOGIST

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BIOLOGY IN ANCIENT PALESTINE

By L. P. Coonen, Ph. D.
University of Detroit

Palestine has never been a world power. And only in one brief period, about 1000 B.C., under King David, did she expand beyond her usual modest boundaries. Nearly always this ancient land has been no larger than our state of New Hampshire. But her geographic fate has made her prominent in world history. She occupied one approach to the African-Egyptian land bridge; thus her lands have been a convenient runway for the armies of footloose kings, emperors and pharaohs who sought either her possessions or those of her neighbors. Sometimes, however, two foreign armies met in bloody conflict upon her plains and in her cities and valleys, almost oblivious of her and disdainful of her sovereign interests. Usually the peoples of Palestine, even when the effort was made, were insignificant deterrents on this threshold between Africa and the ast. And so, she has been subdued and raped by several tribes and nations during her long succession of struggles.

Her early history is a story of the assembly of peoples. Beginning about 3000 B.C., various waves of Semites from the north and the east had occupied this region, sometimes ignoring each other in isolated islands of occupancy, but more often struggling each for supremacy over all others. These surging ethnological units almost succeeded in political homogenization. We see the transition from a thin, turbulent multi-tribal sol into a thicker political gel proceeding with definite success in view. Then suddenly, in 1478 B.C., it was curbed. Egypt's Thutmose III, a hen-pecked monarch (1), when his queen died, came north and gobbled up land and peoples for his domain. His occupation was insecure, however. It was encroached upon and weakened by migrating Hebrews from distant Mesopotamia, Amorites from the northeast and Hittites from the north country. Each group held an uncertain sectorial power for a shorter or longer time, usually a few decades. Then Egypt returned in determined strength. The totalitarian Pharaohs of the Nineteenth Dynasty dispatched their legions to bend the wills of every last inhabitant.

Egyptian power endured until about 1200 B.C., when the Philistines, a Semitic maritime group, moved into the shorelands and stubbornly refused to leave for the next two centuries. They ruled, and after a fashion, united several peoples of the area. Curiously, they left, among other legacies, the name "Palestine." More significantly, they forced Egypt's tentacles to withdraw.

Foreign avarice was far from dead. Another aggressive neighbor was activated during this period (1200-1000 B.C.): the Aramean tribe from the Syrian Desert settled in the northern portion of Palestine. And the Israelites, under Moses, returned from their Egyptian exile to occupy the hilly country. Relative quiet endured at last.

Was this the beginning of political stability? For a time, yes. After the reigns of Saul, David and Solomon, in a rising crescendo of glory, we bring our sketch up to about 1000 B.C. The climactic achievements of Solomon were peace, prosperity, unity and power enough to seemingly insure an enduring place of incluence for the twelve united tribes of Israel. But, after Solomon's death, the cloven realm quickly fell apart. In 722 B.C. Sargon II of Assyria attacked and took northern Israel. And about a century and a half later (584 B.C.) Babylonia grabbed the rest. These two enemies subsequently ran off with most of the tribal populations, again to seal for the people of Palestine a fate of bondage in strange and foreign lands.

Misfortune continued. Disgraces were heaped upon the Jews century after century. Virtually all neighboring nations in turn subjugated them, so that during the next twenty-five centuries they were to be humiliated by Assyrians, Macedonians, Romans, Byzantines, and more. Some were only minor powers. We find ourselves running off in a few words the trials, hopes, disasters and despairs which, under each conquerer, form a sordid story told only in volumes of trials and rivers of tears.

Out of it all—this cauldron of physical and mental strife—arose two of the world's major monotheistic religions and sources of goodness: Judaism and Christianity. And among the lesser intellectual developments appeared some biological data, never in themselves to be crystalized into a formidable body of scientific knowledge, but becoming a small tributary in the system of waterways which eventually joined the organized Body Biologic under the Greeks.

To establish incontestable priority of man's various contributions is impossible. Whether India, Greece, China, Palestine, Mesapotamia or Egypt first set forth a certain idea which was to take fire in the minds of men is hard to see from our remote vantage point. We try to judge the merit of peoples in the maze of historical uncertainties, the confusion of dates and names, and the fragmentary testimony at hand. It is a risky business for the historiographer, but risks are in order here. More testimony will change the picture from time to time —at least in its minor details—and we must keep an open mind to allow for even major strokes of revision as archeologists lay before us new evidence.

In this land, which knew the arrogance of Rome's various Caesars and the tyranny of Egypt's many Pharaohs, other power-drunk champions were to stomp and strut. Under the heavy heels of Alexander the Great, a Macedonian; Sargon II, an Assyrian; Nebuchadnezzar, a Babylonian; and Omar, an Arab, plus many less famous characters in world history, sadness and dejection plummeted to an alltime record of depth and duration. In that psychological climate Palestine's people were hardly disposed to breed science, either in principles or technologies. And, perhaps for this reason, ancient and mediaeval Jews did comparatively little to engender scientific ideas. Although persecution and despair are not good settings for wooing nature's secrets, they do foster other intellectual achievements. Here religion penetrates, and literature thrives. Here are generated the sustained cries to heaven for help and mercy.

What biological interests we find in Palestine are registered in her religious and legal writings. And so, especially, to the Old Testament and the Talmud we turn. Both are old. The Pentateuch was probably written prior to the sixth century B.C. (2) — perhaps as early as the eleventh or the twelfth century B.C. (3) (4) the Talmud, by which we usually mean the Babylonian Talmud, was not committed to writing until about 500 A.D. Its text was much older, orally sustained for decades or even centuries.

Solomon knew considerable natural history (5), and probably composed a medical treatise (4). Considering his reputation for wisdom, we should not be surprised that the nature around him awoke his interest and invited his understanding. Much earlier, Moses seems to have had a grasp of the current practice of medicine (6) (7). No doubt, his experiences in the court of Pharaoh, if he was a favorite of the ruler as reported, were instructive and beneficial: he "knew the best people."

Agriculture

Land and farming were basic and highly respected among the Hebrews, so that the plow became the symbol of economic respectability. Peoples without cultivated lands were considered inferior, at least after the Canaan influence had modified the ancient position of the shepherd. (8)

The merchant class in this area was suspect. Egypt had long sent her peddlers through the gates of every Hebrew city. Their commercial misdemeanors were rife, and were actual or suspected in Hebrew traders as well. Even gentle and wise writers reflect the mild imprecation of a whole people: "A merchant shall hardly keep himself from wrong-doing." (8). The tillers and the herdsmen, it was implied, were closer to virtue.

Israelite agriculture certainly was a fortuitous adventure. Although many of her lands were better then than now, many of the fields were hills, and many of the hills were rocky. No doubt, the challenge was at times too great. Droughts, insects, and human pillagers constantly tried the Hebrew's patience and tested his ingenuity. In psalm LXXVII, 46, we hear the ancient cry of crop failure: "and he gave up their fruit to the blast, and their labors to the locust." And another verse in the same psalm records the accepted tragedy of destruction: "He sent amongst them divers sorts of flies, which devoured them . . ." Stanley (9) describes the locust clouds and their wake of devastation. But, despite the hardships, these Semitic tribes usually managed to eke out a marginal living from their gardens and flocks.

The fig, the olive and the grape were respectable plant friends. However, hard grains, together with leafy and root vegetable crops, were mainstays. These staples were abetted by what may have been unusual biological phenomena. The manna (from *Man hu*—"what is it?") in the desert was organic and nutritious material, most probably with a natural origin and explanation. One source (10) indicates that lichens (*Lecanora esculenta*) may have been wind-borne to the famished children of Israel. A quite different explanation is that *Nostoc*, a fleshy and genatinous alga, which in quantity resembles tiny boiled onions, could have been the biblican manna (11). It grows rapidly at night in the highly mineralized soil of the desert, aided by heavy nocturnal dew. *Nostoc* still grows in certain desert areas of China, Pakistan and California, and still is eaten by man. But, according to Radin (8), manna was prepared by *grinding* in either of two ways, both employing the surface of stones. Lichens, parched and leathery, might conceivably be milled; the gelatinous *Nostoc* could not have been. In neither case would the Israelites be confirmed biologists simply because they survived on unusual plant life.

However, the decision, whether inspired or studied, to eat the strange substance suggests a wise employment of natural history.

Medicine and Surgery

The physician of biblical times did not seem to enjoy the highest regard of his fellow men. Because his position and prestige were suspect we note that certain influential writers rise to the defense of medicine and its practitioners. One writer impelled by duty, bolsters the sagging cause: ". . . the Lord created medicines out of the earth and let not the prudent man despise them." (12). And the Talmud speaks up to remind suspicious readers that the art of the physician is sanctioned by the Torah. Radin (8) offers a neat word-package of the situation: (Medicine was) "less than a calling befitting a gentleman."

Hebrew tradition has it that a knowledge of herbs and roots was handed down from Enoch to King Solomon and written in "The Book of Medicine." Further, the Talmud mentions a "List of Drugs." But both the Book and the List have been long ago lost (13) and we have only the written echoes of their contents involved in referential writings of others.

Frazer, (14) perhaps over-emphasizing the scapegoat device, has the ancient Hebrews driving away suspected leprosy by releasing a bird which spirited away the evil. Although pathology was not yet born, the Bible describes or mentions twenty diseases (15). Among them were: hyperemia, lung tumors, atrophy and abscesses of the kidneys, tropical dysentery, pallid anemia, dropsy, intestinal worms, phthiriasis, scorbutic stomatitis, jaundice and diphtheria. The latter was so feared that the first case in a community was announced by a piercing blast of the shofar. Ordinary contagious diseases rated such publicity only after the third case was discovered. Moses probably removed the first Guinea worm parasite referred to in Deuteronomy and Numbers as fiery serpents (4).

Two strong shafts of light are shed on human physiology. The Talmud records that respiration is a burning process, and that saliva is an agent of digestion (16). Brief references, they are, but so directly to the point that we look for explanations which are not there.

Early surgery on the human body was probably restricted to circumcision. And the "surgeon" was not an expert in medicine or anatomy. In fact, the first Jewish surgeon was probably Abraham (Genesis 17: 10, 23, 24), who obeyed the command of God to circumcise himself, his male servants, and his son.

Although anatomy and surgery remained on a low level of development, certain knowledge and practices are alluded to, especially in Talmudic writings. Caesarian section, excision of spleen, venesection, imperforate anus, trepanning, and sutures are specifically mentioned (16). Food inspection must have lead to some understanding of anatomy and comparative anatomy. References to the pericardial layers, visceral pleura of certain domestic animals, cloacal opening of birds, and the ruminant stomach of the ungulates have been singled out for recording by Hebrew writers (17). Although the description of man's morphological abnormalities may have been the major contribution (17), important normal anatomical references and observations also were committed to writing. The oesophagus, larynx, trachea, meninges, and reproductive organs are mentioned (16) with considerable familiarity in the Talmud, and several human visceral organs are mentioned in the Old Testament (4). A description of the surface of the lungs is a noteworthy feat, and ascertaining the nature of the cauda equina, in the third century, is one more. Perhaps of greater importance, is the fifth century observation that severance of the spinal cord results in paralysis of distal parts

(17). The number of human bones was fixed at 248-252 (16), with little descriptive fuss to support the claim.

Although the physician had neither training (16) nor prestige (8) in ancient Palestine, he patched up the human body in what seems now to have been daring and devoted duty. He restored fractures and dislocations; he fashioned and fitted artificial limbs and teeth; he supplied crutches to the crippled and a "sleeping draught" to the wounded and suffering. (16). To cause bleeding, which was to become a fancied and fashionable cure-all centuries later in parts of Europe, he applied the leech.

Sanitation and Hygiene

Some writers (16) (5) beat the drums of praise for Hebrew progress in sanitation and hygiene. This is sharply evident when comparison is made with the sanitation habits of contemporary peoples (4). No doubt, Hebraic contributions were noteworthy, even if some of them must accede to or share with other people Science's most cherished prize, — Priority. Oliver (18) insists that the Old Testament was the source of the first sanitary code. Whether or not absolute priority in the principles of sanitation can be established here in history, medical jurisprudence does owe much to the religio-legal phrases of the Old Testament.

Moses, the Great Lawgiver, suggested practical methods of curbing the spread of leprosy (5) (7). The efficacy of his admonitions is not recorded. Quarantine is mentioned in II Paralipomenon 26: 21: ". . . the king was a leper and dwelt in a house apart . . ." Circumcision, a religious rite throughout the history of Israel, probably started as a fundamental act of practical hygiene by other peoples. The religious rite here underwrote its general acceptance and perpetuity.

According to Stewart (6), the Hebrews were properly warned against drinking bad water, and salt was used to sterilize a contaminated well (IV Kings, 2:19-22). Perhaps only leeches and crustacea were known, but the general *effects* of pathogenic protozoa and bacteria could have been known too.

Common sense, always the motif in any segment of science, was very evident in the Pentateuchal code (e.g. Leviticus 13, 14 and 15) where disinfection, and burning of garments were prescribed practices in the control of leprosy. Gordon (4) lists several pentateucheal reasons for ablutions, e.g. if anyone touched a menstruating woman, or any article used by her, or if one had certain communicable diseases. Food animals were declared clean or unclean, probably based upon man's limited experimental evidence. The swine, for instance, condemned by the Hebrews, is known by modern parasitologists for the veritable menagerie of parasites which it is and was. By the same token, the cow is not "clean." She harbors the frequent parasite, *Taenia saginata* larvae, which causes the "beef tapeworm in man." And the fish is host to serious human parasites. But, that was the law. The Book of Leviticus states part of the situation (11th chapter), using certain anatomical criteria for separating the forbidden from the desirable creatures. Here is a suggestion of some comparative anatomy:

"And the Lord spoke. . . . These are the animals which you are to eat. . . . Whatsoever hath the hoof divided and cheweth the cud. . . . But whatsoever cheweth indeed the cud and hath a hoof, but divideth it not, as the camel . . . that you shall not eat . . . but reckon it . . . unclean. The cherogrillus . . . is unclean; the hare also . . . and the swine. The flesh of these you shall not eat, nor shall you touch their carcarcasses, because they are unclean to you.

These are the things that breed in the waters, and which it is lawful to eat. All that hath fins, and scales . . . you shall eat. But whatsoever hath not fins and scales . . . and live in the waters shall be an abomination to you, and . . . you shall not eat. . . .

Of birds . . . these . . . you must not eat. . . . The eagle, . . . griffon, . . . osprey, . . . kite, . . . vulture, . . . raven, . . . ostrich . . . owl, . . . larus, . . . hawk, . . . screech owl, . . . cormorant, . . . ibis, . . . swan, . . . bittern, porphyrion, . . . heron, . . . charadrion, . . . houp also, and the bat."

Note that orthopteran insects are acceptable fare:

Of things that fly, whatsoever goeth upon four feet, shall be abominable to you, but whatsoever walketh upon four feet, but hath the legs behind longer, wherewith it hoppeth upon the earth, that you shall eat, as the bruchus . . . attacus (probably a locust) . . . ophiomachus, and the locust.

That which walketh upon hands . . . shall be unclean. . . . These also . . . the weasel, . . . mouse, . . . crocodile, . . . shrew, . . . chameleon, . . . stello, . . . lizard, and the mole. . . . But an earthen vessel, into which any of these shall fall, shall be defiled, and therefore is to be broken.

That which walketh upon hands . . . shall be unclean. . . . These also . . . the weasel, . . . mouse, . . . crocodile, . . . shrew, . . . chameleon, . . . stello, . . . lizard, and the mole. . . . But an earthen vessel, into which any of these shall fall, shall be defiled, and therefore is to be broken.

Whatsoever goeth upon the breast on four feet, or hath many feet, or traileth on the earth, you shall not eat. . . .

Plants

Israel had a cursory interest in plants *per se*. She was intensely interested in certain ones, however, for economic or ceremonial reasons. Particular kinds of grains were to be used for unleavened bread. Laws regulated the use of particular salad vegetables to be eaten with the Passover Roast; the flowers to be used in the festal garlands for the tabernacles; the plants to be used for incense; and those to be used "in the sacrifice of the Red Heifer" (9).

Botany, as an organized discipline, did not exist. Yet botanical knowledge is manifested in Jewish writings dedicated to religious objectives. Parts of plants were mentioned again and again (20), with a varied terminology suggestive of the primaeval state of plant knowledge. For instance, twenty-three names for stem or branch appear in the Old Testament (19). Plant classification in the pre-Christian bible is restricted to three plant categories: Grasses; Herbs with seeds; and Fruit trees (19). One hundred plants, a small fraction of those known in the region of Palestine, are named.

The Talmud elaborates more on systematics, but economic importance is the only hinge upon which the system articulates. Three large groups were recognized early; another was added later:

1. *Trees*
    a) Fruit-bearing
    b) Fruitless
2. *Vegetables*
    a) Grains (five familiar cereal grains)
    b) Other grains and edible seeds (e.g. peas, beans, poppies, sesame, rice)
    c) Fruits edible; seeds not edible (onion, turnip, garlic, leek, nutmeg)
3. *Garden vegetables in small beds*
    (Some duplication—turnips, radishes, beets, onions, coriander,
4. (Added later) *Fruits of the*
    celery, lettuce)
    ground
    Cucumbers, castor plant, watermelons, medicinal plants.

Other economic plants, not easily fitted into the system, sometimes occupied a place of prominence in the literature. Linen, the badge of elegance in biblical times, was sometimes produced from locally grown flax; sometimes it was imported from Egypt (8). The carob tree ("Harub" in the Talmud) seems to have been important. Each tree produces up to a half-ton of food annually, the pods being crudely nutritious. These fleshy seed pods, together with their seeds, were ground and fed to cattle. Although the Jews rarely ate these pods, Arabs, Moors and Italians did use them for food. John the Baptist may have lived on them at times— "and his meat was locuts. . . ." (Matt. 3:4)—for this tree is also called the locust tree. The coarse product is still called "St. John's Bread." On the other hand, he could well have eaten the locust, an insect, which we have seen was acceptable as food.

The sycamore, which was actually a fig tree, is mentioned several times. Although local trees supplied the ordinary needs for buildings, furniture, boats and oars, cedar of Lebanon supplied the de luxe wood. Its long-term resistance to weather and decay was well known. Writers of the Old Testament often refer to cedar with implied accolades. Just as the Assyrians used cedar for the king's palace and the Persians for the Temple of Apollo at Utica, the Jews used it for shipmasts (Esechiel 27:5) and the great temple of Solomon (21). Fir trees were inferior, but suitable for floors and ships' planks (Ezechiel 27:5).

In spite of many references to unleavened or ceremonial bread, the Jews did use leavened bread as a staple food. Without understanding the nature and importance of yeast, they employed and perpetuated this unicellular fungus by keeping pieces of sour dough from one baking to another (8).

Perhaps we are impregnating a simple poetic phrase from Isaias (40:6) with the formidable concept of photosynthesis. By innuendo the idea is present, fairly screaming to be heard: "All flesh is grass. . . ."

Animals

Biblical animals were accepted in ways somewhat different from our Western habits. Meat was principally for sacrifice; less often it was eaten simply as nourishing food. Although the hart, antelope and partridge were hunted for food, hunting was never a sport, not even among royalty (8). Angling, likewise, was rather a mode of supplying proteinaceous groceries than recreation or sport.

Although the horse was common at times, it conjured up militarism, aggression and subjugation. And just as the horse was an animal of war, the ass was a symbol of peace. It is mentioned 81 times in the Bible (23). As a passive friend of man, it was never spoken of in terms of derision or disdain. Strangely enough, the dog, man's trusted companion since the stone ages of pre-history, enjoyed little esteem and few favors in Palestine. It was despised; considered unclean; and, by nature, evil. "Dog" was a symbol of treachery and term of lowest contempt (8).

Birds and kids were common pets of the household. A small bird tied to a string or a gamboling kid near the home's doorway were evidences of the Israelites' love for God's vertebrate creatures. Much more eloquent were her humane precepts which we of the West incorporated into our mores only in the 19th century. Mistreatment of animals by Hebrews was punishable by law. It was illegal to yoke an ass and an ox together because of their physical inequality; the ox could not be muzzled while working in the field of tantalizing grain; and he who would take a brooding bird was a criminal.

Besides the list of unclean animals specified in the Pentateuchal Code, some were avoided through deep-seated fear. Snakes were considered demoniacal, mysterious and dangerous by Israelites and their neighbors. The Babylonians carved images of serpents on their boundary stones. As graven sentinels they were to keep intruders away (22). Even mice, fragile and timid inhabitants of man's abode since greatest antiquity, were fearsome creatures here. They (or were they really rats?) were sent as a plague upon the Philistines (I Kings 6:5). What of the barnyard cock? Surprisingly, it is not mentioned in the Old Testament (21).

The turtle dove enjoyed special respect; it was the only bird permitted at sacrifices. The dove, ever since an emblem of peace, was the messenger sent forth from Noah's ark—an instrument of hope and a harbinger of tranquility.

Invertebrates, generally speaking, received scant attention. Perhaps few of them, besides the insects, were known to exist by the biblical peoples. One outstanding exception was the mollusc *Murex*. This large marine univalve was the source of the famous purple dye extensively used in Jewish garments.

None of this is zoology in the sense that experimentation or accurate description was resorted to — it was merely manifestation of a consciousness of the biological world and an appreciation of differences based on scrutiny and comparison.

Classification of animals, like that of plants, was crude—a mere lumping of individuals for convenient reference. One such system was based on modes of movement of the organisms: the Walkers, the Fliers, the Creepers and the Swimmers. Another, in Genesis (1: 20-25) using mixed criteria, lists six groups:

1. Creeping creatures
2. Fowl
3. Whales
4. Cattle
5. Beasts
6. Man

In Ezechiel (38:20) the cetaceans are omitted; likewise, in Deuteronomy (4:17, 18) the whales are not mentioned.

The criteria of classification were several and varied. Here are some of them:

1. Mode of movement: e.g. flying-swimming.
2. Habitat: e.g. water, air, land.
3. Origin: *from* e.g. water, earth.
4. Mode of propagation: e.g. "fast breeding" (insects).

Only folly would press the point to make simple classification here the ancestor of subsequent elaborations of taxonomy. Behind the project in any age, however, are convenience and facility in dealing with an unwieldy body of heterogeneous organic types. If organisms are dealt with simply for food, as they usually were here, the system remains simple and obvious. In conforming with implied objectives the Israelite "systems" of classification were as successful as the species-splitting, genus-coining adventures of twenty or thirty centuries later.

Genetics and Eugenics

That "like begets like" is the pregnant premise from which several worthy conclusions and practices followed. And, somehow, purity of strains was endorsed and guarded. The hybrid was a freak—a sin against nature. No mules here and no hybrid grains, and it was by design. Marriages of close relatives were standard procedure, even expected or demanded. In fact, special laws were promulgated to *allow* strangers, on rare occasions, to marry into a blood group (24).

Certain inherited imperfections were boldly labelled "dangerous" and marked for suppression or extinction. The marriage of a man into an epileptic family was forbidden (15). If this law were rigidly enforced, the obvious fate of inheritable epilepsy is clear, or at least the intent is clear. On the other hand, if this was to be taken literally, the male carriers of epilepsy being allowed to marry "out" of the family, the proscription would inhibit rather than eradicate. The hereditary transmission of haemophilia, although not deliberately regulated by law, was in a sense a recognized biological principle employed in writing the law. If two successive children died of circumcisional bleeding, the operation was forbidden on subsequent members of that family (16).

Strange human physical traits are recorded, without biological commentary. For instance, a group of 700 warriors (Judges 20:16) made a lasting impression, for they were, every last one of them, ambidextrous, "Fighting with the left hand as well as the right: and slinging stones so sure that they could hit even a hair. . . ." Ambidexterity was then, as now, a rare gift. Even prehistoric man favored his right hand in crucial combat. Paleontology and Logic have colluded to write a unique footnote: At Drachenhohle, in Austria, the ancient hunter left the crushed skulls of many bears. Since they were all fractured on the left side (25), it seems that we are justified when we insist that these paleolithic clubmen consistently swung an effective "right" when in head-on struggle. No little wonder then that the 700 gifted warriors assembled in one military unit left witnesses and writers in unending consternation.

On another noteworthy occasion a polydactylous heavyweight, with twelve fingers and twelve toes, stalked across the biblical stage. He is mentioned twice (II Kings 21:20, I Paralipomenon 20.6); each time, the record states, he promptly dispatched a normal adversary. No doubt the four extra digits had nothing to do with his success in battle, but they had everything to do with his sneaking into the sacred annals. Polydactyly was not only unusual, it was abnormal and suspect; aspirants for the priesthood were rejected if they had supernumerary digits (15).

Livestock seemed to have been subjected to septennial culling. Every Seventh Year was a period of rest for the land (24). Since many of the fields were given their sabbatical rest simultaneously, pasture and fodder were then available on a diminished scale. This meant reducing the flocks, and reduction was tantamount to Selection. Naturally the poorest animals were eliminated. Call it what we will, this was phenotypic selection. Although not the most effective, it is still the most commonly practiced world-wide improvement method among animal breeders.

Embryology was conspicuous by its elision. Even human embryogeny received little recorded attention. However, the Talmud described a young human embryo preserved in and viewed under olive oil, in sunlight (17).

* * * * *

As in the older civilizations, some biological factors were involved in the writings of ancient Palestine. Although the principles were rarely understood and they were never organized into a teachable or recorded "science," many of them were applied in the precepts and traditions of the Jewish people prior to the birth of Christ.

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MEXICO AGAIN

By David Causey, Ph. D.
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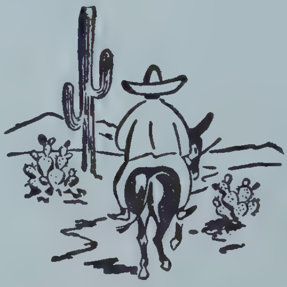

One of these is the author

We spent the first half of the past summer (1955) in Mexico. Entering at Reynosa, the course was Monterey, Torreon, Durango, Mazatlan, San Blas, Guadalajara, Morelia, Mexico City, Acapuco, Mexico City, Puebla, Oaxaca, Tehauntepec, Salina Cruz, Tuxtla Gutierrez, Veracruz, Mexico City, Queretaro, Leon, San Luis Potosi, Mante, Victoria, and out again at Reynosa: a little over 5,000 miles, with one flat, three attacks of dysentery, lots of millipeds, a fair number of parasitic copepods and a few parasitic isopods; and ever so many of those intangible factors difficult to put in the inventory—deserts and mountains, lakes and the seashore, old friends and new ones. (1)

Mexican roads tend to be good roads. All the information we could get ahead of time indicated that the road between Durango and Mazatlan was impossible. In Durango we found the people politely puzzled about our questions—they drive it all the time. We found it much like some roads in the Rockies; occasionally there would be a narrow stretch where some one would have to back up to a wider spot if two cars met, and there was one detour of about a half mile. Mrs. Causey does all our driving; on this particular stretch she was behind the wheel! The biggest hazard was rocks in the road. When a Mexican truck driver stops to have a nap under his truck, to fix a flat or to give his engine a complete overhaul, he scotches it with rocks. And when he is finished he drives away, leaving the rocks in the road. Generally they are big enough to do things to the underside of the car if you try to drive over them. But you don't have to. We met one lady in Mazatlan who had driven the road, some two years ago, at night with two sick children! The road across the isthums was another impossibility—our road maps drawn up by the tourist service of an oil company indicated that we had to go back to Mexico City from Tehauntepec by way of Oaxaca to get to Veracruz. We found the road across the isthmus quite passable, graded, with a wide roadbed, but not all the hard surface on. There were three streams with temporary bridges, along side of which fine permanent ones were being built, and one with a ferry. The road is good now, and it will be very good next summer. You can rely upon the information about the road ahead which you get from the filling station attendants or the hotel clerks. If you get lost, just follow the next bus which comes by. There are lots of good roads in Mexico not on the road maps.

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(1) My dean's Research Committee provided a substantial grant, for which I express my thanks. I was deeply touched when the dean, red-eyed from weeping, and with his noble face twisted by the pain of parting said, chokingly, ". . . and if you will stay there we will double the grant."

The western side of Mexico struck us as very Americanized. Many of the motels and hotels are run by Americans—amateurs, a Polish hotel keeper scornfully called them. But they know American ways and meet them. The meals are what you want, and you pay accordingly. Not a single clove of garlic sneaked up on me along the thousand odd miles between Mazatlan and the isthmus of Tehauntepec! So far as my researches go, the garlic belt is the eastern *tierra caliente* and the isthmus, a long J-shaped, low lying belt where dieting is easy and even a pleasure. Along the western side you meet many tourists, especially from our west coast, and from such foreign parts as France, Holland, and Texas. And if you are zoologists collecting, hence ragged, dirty, and smelly, many will avoid you as low characters. Not the Mexicans, they will be interested, and often stop to help. Even the Pemex stations seemed honest on this western side, but we never gave them a fair chance to be otherwise.

Fishing had been very good two weeks earlier, or would be two or three weeks later on at every seaport we visited, and of course it was superb a little farther down the coast. It was the same on the Mexican east coast last summer. We've never yet been at a place where the fishing was up to par, and we've been trying for five years. Mazatlan provided us with some sailfish caught by sportsmen, and a chance to examine a good many commercial fish. At one dock they claimed to fish from Guaymas to Panama, and they did have a lot of fish. They had had more the week before! San Blas had few fish and fewer fishermen; I suspect it hasn't been really good since the days of Cortez. It's quaint, but what can a parasitologist do with quaintness? Acapulco is famous for sportsmen and bathing beauties. It was the off season, of course, and we didn't see many game fish. None I looked at had bathing beauties on them. Thanks to Mark Antonio, one of those loveable little waifs we seem to be adopted by wherever we go, we did well with the market fishermen. Mark had little English, mainly "Lady," but Mrs. Causey and he were full of Spanish. Occasionally the former threw a few English words at me, like scraps to a dog, and I wagged — I mean I was grateful. Mark, a diver after coins, so far as profession went, abandoned his career and became a parasitologist. He held the tired fisherman, anxious to get home after a night's fishing, like the ancient mariner did the wedding guests, and we worked through the little boat loads of fish.

Garlic unnecessary

At Tehauntepec, famous for its fat mammas, we found a fish market where the owner welcomed us, allowed us to work over his boxes of fish, and appeared as interested as were his customers. Usually we find that the fish merchants get nervous and begin to fear we are hurting the sale

Tehauntepec has more than fat mammas

of the fish, but not this noble character. We were allowed to repeat the next day. At nearby Salina Cruz we were given the key to the city by the captain of the port, and personally escorted about by the captain of the troops stationed there. We even got some parasites off the few available fish. The port captain thought he spoke English (I thought it was Aztec!), but after a few brave attempts he gave up and all went smoothly in Spanish.

Actually, unless you need to distinguish between lice from fish and those from heads, you don't need much Spanish. *"Dos cervezas, grande,"* will meet all practical needs, and after all, you probably haven't gone to Mexico to discuss Kantian philosophy with fishermen. And it is better not to understand Spanish when a traffic policeman catches up with you going the wrong way on a one way street. Mine quit after much explaining and trying to illustrate with two fingers placed head-on, remembered that all gringos are loco, subdued his blood pressure, and waved us out of his sight. A woman can do better. I sat by my better nine-tenths while traffic piled up behind us as she plaintively bleated *"Como?"* until the poor traffic cop gave up yelling and pointing, stopped all the rightful traffic, allowed her to make an illegal left turn into the main drag of Mexico City, and smiled like the gentleman he was as we went by. He was a married man and knew when he was whipped.

At Tuxtla Gutierrez we found Dr. Miguel Alvarez del Toro. A native of Chiapas and a graduate of the National University at Mexico City, he is tallish, shy, and very competent. He *is* the Instituto Zoologico of the state of Chiapas. He collects the animals from the wilds, mounts them in professional style — I suspect he even prints his own labels. He has a fine exhibit of the native vertebrates and a start, largely insects, of the invertebrates. Nearby is his zoo, with a fine collection of native mammals, birds, and reptiles. Only animals from Chiapas are on exhibit, and he grinned when Mrs. Causey asked him where the elephant and kangaroo were. Primarily an ornithologist, he is currently working up the reptiles. He is the author of a fine book on Chiapas animal life. (1) He read my letters of introduction, including the wonderful one the lady at the Mazatlan Tourist Bureau wrote which explained that I was looking for lice on marine fish, and gently suggested that I would not find many in Tuxtla Gutierrez. He could have told me Homer's story about the man with the oars, but didn't. Anyway, he left his work, took us up into the mountains, showed us the Chiapas version of the Grand Canyon, and then to a rain forest where millipeds occurred which were

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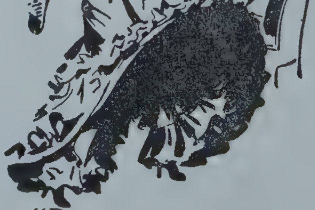
(1) Los Animales Silvestres de Chiapas.



"Dos cervezas grande"

so huge, that even I, with my reputation for cold facts, refuse to mention their size. I hate to admit it, but of the five of us who looked for millipeds easily confused with fallen logs, only I failed to see any. In utter disgust I squatted down (something I do well), and raked out the little ones which are hard to find and which I trust will be of greater scientific value than the cord wood the others were gathering. We're going back to Tuxtla Gutierrez!

Veracruz is my favorite Mexican city. I don't know why— I've met my worst defeats there in the copepod way. Armed with letters in Spanish written by Mexicans to supplement Nellie's explanations, we talked with the fishermen. They understood, they discussed the matter gravely in the slow Spanish that even I could follow, and they refused to go. I think they considered it foolish to go catch fish not good to eat, even if paid to do it. At Bocca del Rio, Pepe swore by all his canine ancestors that come twelve o'clock noon the next day he would have a boatload of fish for me. And next day we couldn't even find Pepe. I don't wish him any good fortune.

They couldn't find Pepe!

We lost so much time not getting fish that we had only a half day at the wonderful Isle de Sacrificio, where the little old lady from Yucatan graciously remembered us from last summer. Just a few copepods from market fish, the same as last summer, and that wonderful bay must have dozens of fish and copepods I've never seen.

Near San Luis Potosi we had a story book experience. There had been a rain in the semi-desert, and as we drove along Nelle said she saw a milliped in the road, crossing the highway. We stopped to get it, found another, and being both smart and quick-witted, eventually arrived at the conclusion that if they were crossing the road, they might be on either side. Were they? Thousands of them, apparently all the same species, but of many sizes and both sexes, all over the ground and crawling up into the shrubs. I wasn't feeling well, it was very hot, and I nearly had a stroke and/or heart failure before the collecting and the photographic work in color and black and white (some good!) was done. We got nearly a quart of them, and went on our way rejoicing. At Oaxaca and here in the desert are the only two times in a long lifetime as a milliped hound that I have had to go back to the car for more containers.

"many sizes, both sexes"

I'd like to tell of the wonderful cathedrals we visited—the great one at Mexico City, the one at Morelia (we heard the organ!), and the one at Puebla (we climed the tower to see the bells the angels put there); I'd like to tell of the stone work done by

Indian hands whose owners might not have seen a masonry building before they finished theirs, and done four centuries ago, so there would be sermons in stones to proclaim the glory of their God; I'd like to try to tell of the beauty of the gold covered altars and walls—we bury our gold at Ft. Knox! I'd like to try to show what a wonderful people can do against considerable odds—we were told that the Republic of Mexico doesn't have as much income from taxes as does the city of Dallas! And I'd like to tell a Somerset Maugham story we encountered, of a hotel keeper who drank himself into a good humor by noon each day, an elderly oil man who balanced himself on the sharp precipice of D.T.'s, but never fell over, the younger weakling who yes-ed him, and of course, a footloose lady chemist whose frustrations weren't being helped by the humid tropics (maybe you think Maugham writes fiction—I assure you that he writes medical case reports). There isn't space, Padre Keefe is about to excommunicate me, so *"hasta la vista"* until next summer when, God willing and my arthritis permitting, we'll be listening to the sands of Sonora and looking at fish along the Gulf of California. We haven't been to Yucatan.

"Hasta la vista"

Robert J. Hosley, Ph.D., has joined the biological production division of Eli Lilly and Company, Indianapolis, as a bacteriologist. His work concerns the tissue culture and virus phases of polio vaccine development.

A native of Rochester, N. Y., Dr. Hosley was graduated from Charlotte Junior-Senior High School and served three years with the United States Army. In 1949 he received a Bachelor of Arts degree in general science from the University of Rochester. Taking his graduate work in medical microbiology at the University of Michigan, he received his Master of Science degree in 1951 and his Doctor of Philosophy degree in 1955.

Dr. Hosley is a member of the Society of American Bacteriologists; Biometric Society; American Association for the Advancement of Science; Society of the Sigma Xi, scientific honor society; Phi Kappa Phi, scholarship honor society; and Phi Sigma, biology honor society.

NEW BOOKS

This section offers brief, mostly uncritical reports on the general content of recent publications in biological and related fields. Only the longer critical reviews will be signed. Each notice will be preceded, wherever possible, by the L.C. card number, for the convenience of Librarians.

—A—

ADAPTIVE HUMAN FERTILITY, by Paul S. Henshaw; McGraw-Hill Book Co., 330 West 42nd Street, New York 36, N. Y. 1955. 322 pp., 28 figs., $5.50.

55-5687

As the result of his experiences in overcrowded Japan, the author proposes a plan which he calls "Teleogenesis" under which human will guides the human population growth process towards optimal population maintenance. The book is objective, fair and unhysterical, no matter what one's attitudes on the subject may be. Dr. Henshaw thinks that in adaptive fertility he has found an idea on which scientists, statesmen and humanitarians can work together.

ADRENAL CORTEX, ed. by Elaine P. Ralli; Josiah Macy, Jr., Foundation, P. O. Box 575, Packanack Lake, New Jersey. 1954. 187 pp., 27 figs., VII tabs., $3.75

A51-4008

The fifth conference on Adrenal Cortex under the auspices of the Josiah Macy, Jr. Foundation was held at Princeton on 4 to 6 November 1953. It consisted of three papers, which together with the group interchange and discussions, and the list of each author's references make up this volume. The first paper on the adrenal cortex was read by H. L. Mason of the Department of Biochemistry at the Mayo Foundation. His title was: "The Salt and Water Factor of the Adrenal Cortex." The second, by Ralph I. Dorfman of the Worcester Foundation for Experimental Biology, was entitled: "The Metabolism of Adrenal Steroids." The third paper, on "ACTH—A Single Substance or a Mixture of Hormones," was presented by Frank G. Young of the Department of Biochemistry, University of Cambridge, Cambridge, England. There were 19 representatives of some of the world's leading biochemical and medical centers present. Their discussions make up the most of this book, the last in the adrenal cortex series.

ADVENTURING WITH BEEBE, by William Beebe; Little, Brown & Co., 34 Beacon St., Boston 5, Mass. 1955. 283 pp., 15 pl., 1 text fig. $4.50.

55-9835

The Director Emeritus of the Department of Tropical Research of the New York Zoological Society again makes his bow to the reading public. He has nothing new to offer. Instead, he has chosen some twenty-one of his best-loved chapters from seven of his previous works. Thus, the adventure-hungry may find in one volume the cream of what is contained in many. Since Dr. Beebe has had more than one man's fair share of scientific argosying, above, on and under the sea, as well as deep in the jungles, his books are seldom found on second-hand shelves. It is good that he has put the choicest of his memories before us again.

AFRICAN INSECT LIFE, by S. H. Skaife; Longmans, Green and Co., 55 Fifth Ave., New York 3, N. Y. 1954. 387 pp., 190 figs., 75 pls., 5 in col. $11.

Dr. Skaife is a former government entomologist in the Union of South Africa. His book is a manual for amateur students on natural history, for farmers, gardners and householders who are, as he says, interested and with to know something about the numerous insect friends and foes they see about them. For us in this country there is much to learn, as this book amply demonstrates. The large number of illustrations, either drawings, or plates, in color and black-and-white, compare favorably with anything being published on this subject in the U. S. today. The author has a knack of using uncomplicated language without sacrificing scientific accuracy. The book is, therefore, as interesting as Fabre, with the added advantage of covering an area which is all too often taken for granted.

ALASKA, WILDLIFE IN, by A. S. Leopold and F. F. Darling; The Ronald Press Co., 15 East 26 St., New York 10, N. Y. 1953. 129 pp., 7 tabs., 6 figs. $2.75

53-12201

The very direct opening statement in Fairfield Osborn's foreword to this book sums it up nicely: "This field study concerns the great horned animals of Alaska and their environment in one of the last frontier lands of the world. A work of keen observation and scholarship, it analyzes the ever changing relationships between man, these grazing animals and their habitats. It stresses the importance of wildlife management in a territory whose invaluabue assets are the living natural resources on the land and in the adjacent waters." Dr. Leopold is associate professor of zoology at the University of California, while Dr. Darling is senior lecturer in ecology and conservation at the University of Edinburgh.

ALASKA'S ANIMALS AND FISHES, by Frank Dufresne; Binford and Morts, 124 N.W. 9th Ave., Portland 9, Oregon. 1955. 297 pp., 92 figs., $3.50

Every one of Bob Hines' illustrations in black and white in this book is a work of art. The author spent a quarter of a century on the Alaska Game Commission, and is therefore eminently equipped to write about the fauna of Alaska, from the world's largest carnivore, the Kodiak bear, down to the smallest rodents. The last chapter on fishing is a jewel because, as the fishing resources of the area become better known, it represents unspoiled natural conditions which in the order of things piscatorial, can't last, much as we might wish otherwise.

ALGAE, HANDBOOK OF, by Herman S. Forest; University of Tennessee Press, Knoxville, Tenn. 1954. 467 pp., 699 figs. $4.75

54-11608

This handbook is a taxonomic key to the algae of Tennessee. As it stands it is probably not fair to judge either the author's work, nor the Tennessee Press, since it is impossible to tell which would suffer the more from the other. Sophomoric doodlings on the end sheets are a poor introduction to what professes to be a work of permanent scientific value. The type, apparently photolithed from typewritten pages, is hard on the eyes, and in some signatures varies in density in a distracting fashion. All in all, it is hardly a good professional job.

AMPHIBIA, THE BIOLOGY OF, by G. Kingsley Noble; Dover Publications, Inc., 1780 Broadway, New York 19, N. Y. 1955. 577 pp., 174 figs., $4.95

This is a much-needed reprinting of the monograph by the late distinguished head of the American Museum of Natural History's department of experimental biology. Although it has been corrected, it has not been abridged in any part. Those who have been looking for a second-hand copy of its long-out-of-print original will be glad to get this new edition which, incidentally, has been issued as a memorial to its author. A sketch of his life by his wife completes the work.

AMPHIBIANS AND REPTILES OF WESTERN NORTH AMERICA, by Robert C. Stebbins; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1954. 529 uu., 104 pls., 52 figs. $8.50

53-11489

This is an entirely new manual for those who are interested in things that creep and crawl, especially in the western out-of-doors. The number of illustrations, sometimes ten to a plate, assures adequate information for the amateur, and adequate inclusiveness to satisfy the scientist or the student. The author makes an excellent point in his raising the question as to what is going to happen to numbers of species whose natural ranges are being destroyed by the population growth and activities in the far West. In view of the fact that in some areas it is already too late to determine the optimum habitats of rapidly disappearing species, the function of books such as this will be to stimulate the keeping of records on what forms we have left, until their turn comes to be annihilated before the bull-dozers of advancing civilization.

ANATOMY OF THE MAMMAL, by James Leach; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N.Y. $4.50.

51-13591

Originally published in 1946, this book met with so favorable a market that the author has been pleased to reissue it with revisions to increase its usefulness and its appeal. It has been kept to its original brevity, even though some of the less emphasized items in the first edition have been more adequately treated. For those who have not seen the original work, it might be well to remark that the author had the inspiration to prepare a textbook which might accompany a detailed and careful dissection of the cat as a type of animal while correlating its structures and their functions with the corresponding elements in the human. Simply and less elegantly one might paraphrase its purpose as "How to learn about your insides from a study of the cat's."

ANIMAL ECOLOGY AND NATURAL HISTORY, FIELD MANUAL OF, by C. P. Hickman; Burgess Pub. Co., 426 So. Sixth St., Minneapolis 15, Minn. 1955. 125 pp., $2.25

Based on the pioneer work of the late Professor Jacob Reighard at Ann Arbor, but considerably modified and amplified, this manual by the Professor of Zoology at DePauw University contains thirty exercises which may all, or in part, solve the problems of those who are teaching ecology, and/or natural history. There are seven preliminary chapters on writing notes in the field, preparation of a work book, equipment furnished either by the school or by the student, methods of preserving, care of aquaria and terraria, general strategy in the field, and taxonomic determinations. Then follow the thirty exercises. Each of these is divided into seven parts: the objective, time, procedure, field notes, lab study, equipment needed on the trip, and references. Since each studnt is required to provide himself with such comparatively costly items as bird glasses and hip boots, it can easily be seen that there's no fooling around in this course.

ANIMAL FORM AND FUNCTION, by W. R. Bheneman; Ginn & Company, Statler Building, Boston 17, Mass. 1954. 488 pp., ills. and diagr. $6.00

Designed to include the best features of the so-called "type" and "topical" approaches to the study of college zoology, this book has much to commend it. First and most important of all, — it is not stereotyped. From protozoa to the vertebrates, each chapter offers fresh approaches to zoology. A few random chapter headings will suffice to illustrate the dynamic presentation of the topics:— "This Is Life: the Characteristics of Living Matter;" "Nature's Dead-End Street: Phylum Porifera;" "Serial Duplication: Phylum Annelida;" "Hydraulics: Phylum Echinodermata;" "How to Live on Income: Parasitism."

ANIMAL LIFE IN DESERTS, by P. A. Buxton; St. Martin's Press, 103 Park Ave., New York 17, N. Y. 1955. 176 pp., 43 figs., $4.25.

Dated originally from Jerusalem in 1923, this reprint brings back to our shelves a valuable study of desert ecology which loses nothing for being centered around observations of life conditions in the deserts of Algeria, North-West Persia, Southern Palestine and Mesapotamia. Comparisons with what has been observed in other arid regions of the world are so frequent that there is no danger of this work's being accepted merely as a monograph on the localities studied. The seven chapters include discussions of desert climates, soil and watercourses, floral environments, animals and physical envirnoments (two chapters), relations between animals and plants, as well as colors of desert animals.

ANIMAL SCIENCE, by M. E. Ensminger; The Interstate Printers and Publishers, Danville, Ill. 1955. 1152 pp., 432 figs., 107 tabs. $6.50.

A cattleman son of a cattleman here presents the third edition and sixth printing of a manual for cattle raisers that leaves nothing to the imagination. It first appeared in 1950, the second edition came out in 1951. This was reprinted in 1952, 1953 and 1954. Such popularity must mean something. An ever so casual inspection will reveal what it is. First of all this cattleman has a hobby of writing. Secondly he has come up the tough way through the 4-H and FFA ranks, then as a farmer, ranch manager, teacher and student counselor. With such a background, it is no wonder that his book is as plain as potatoes and twice as useful. Strangely enough, this is not an Ag School textbook. It is a stockman's reference book. While it is scientific, it maintains its contacts with the stock raiser who wants to know the right thing to do at the right moment. On one score this book wins hands down, —its attention to the historical development of each kind of cattle raising in this country. Some of the old prints which are reprinted here are priceless.

ANIMAL SCIENCE, INTRODUCTORY, by W. P. Garrigus; J. B. Lippincott Co., 227 So. 6th St., Philadelphia 5, Pa. 1954. 503 pp., 272 figs., 71 tables. $6.00

53-11273

Intended as a text for a basic course in animal husbandry, this book would also serve as a guide for anyone who is interested in selecting or judging cattle. It would also be a good reference book for high school libraries in agricultural areas. It is arranged on the traditional basis of one two-hour laboratory and two one-hour lectures for an 18-week college semester. This second edition has been completely revisd and brings its information up to date regarding the comparatively recent changes in livestock and meat grades.

ANIMAL TRACKS, A FIELD GUIDE TO, by Olaus Murie; Houghton Mifflin Co., 2 Park St., Boston, Mass. 1954. 374 pp., 196 figs., $3.75

54-9602

At the ridiculously low price the Riverside Press is putting this on the market for, no one who is at all nature-minded and likes to get out, over the hills and far away, can afford to be without a copy. It is, perhaps, enough to mention further that this book is Number Eight in the Peterson Field Guide Series, a collection of books that has found a warm reception among nature lovers everywhere. The author has built it out of his own collection of observations and plaster casts which he has been assembling since 1921. Some idea of the extent of the work can be gained from our mentioning animals, not mammals, or rodents, which are included. Where else would one find illustrations of the tracks (and often the droppings) of armadillos, domestic cattle, shore and upland birds, turtles and snakes, crayfish, crickets, and, **mirabile dictu!** earthworms?

ANTIMETABOLITES AND CANCER, ed. by C. P. Rhoads; American Association for the Advancement of Science, 1515 Massachusetts Avenue, N. W., Washington 5, D.C. 1955. 308 pp., 50 ills., $5.75, to AAAS Members $5.00

55-7577

This is the report on a symposium presented 28-29 December 1953 at Boston, dealing with the effect of antimetabolites in the control of cancer. There were eighteen subjects bearing on the general topic up for discussion. While the topics and the way in which they were treated would probably appeal more to a medically trained biologist, they have much to offer anyone who is interested in neoplasms, malignant or otherwise. This is a comparatively new approach, but, as the editor so appropriately remarks in his preface, it is one which is becoming absolescent in the short span of months between the presentation of the papers and their publication. Among those participating were S. Weinhouse, B. D. Davis, Lansford & Shive, D. W. Visser, Nichol and Welch, C. P. Rhoads, M. M. Nelson, L. G. Nickell, J. R. Totter, D. W. Woolley, R. E. Parks, Jr., H. G. Mandel, H. E. Skipper, D. R. Ginder, R. Hertz, J. H. Burchenal, and George Bosworth Brown.

AUXINS AND PLANT GROWTH, by A. Carl Leopold; University of California Press, Berkeley 4, California. 1955. 354 pp., 125 figs., $5.00.

55-5386

Subtitled on its dust cover "A Detailed Discussion of the Fundamental Mechanisms of Auxin Action and Their Applications in Agriculture," this book was written in the hope of providing the agricultural research worker with a brief review of the physiological basis, as far as is known, upon which the applied technologies rest. As such it should help those many reearch workers who are dealing with auxins and plant regulators without a full realization of what they actually do to plants. Since there are not many available works which provide as complete an integration of the field as is needed, this author set out to supply this want. He is connected with the Department of Horticulture at Purdue University.

—B—

BACTERIA, THE LIFE OF, by Kenneth V. Thimann; The Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1955. 775 pp., ill. $13.50.

Apparently the "Harvard Plan" with its heavy emphasis on general education at the college level, is not cramping the style of Harvard's faculty. This new work is by no stretch of the imagination an elementary textbook in bacteriology. In fact, it presupposes a fairly good background in the other plant groups, especially the algae and fungi. A cursory study of its pages would seem to predicate a rather healthy acquaintance with chemistry as well. Whether it is used as a text in the physiology or not, it certainly rates a place on the reference shelf wherever bacteriology is taught, or wherever bacteriologists are engaged in their work. The main theme of the book is the growth, metabolism and relationships of the bacteria. The subject matter is organized under the morphology and physiology of the bacteria, the role of microorganisms in the nitrogen cycle, the metabolism of the carbohydrates, and growth and synthesis in the bacteria.

BACTERIOLOGY, TEXTBOOK OF, by Joseph M. Dougherty and Anthony J. Lamberti; C. V. Mosby Co., St. Louis, Mo. 1954. 598 pp., 190 figs., 22 tables. $8.25.

This is a third, and completely revised, edition of a text which first came on the market less than ten years ago. Its popularity may well be understood from the authors' objective, to give the student a student's book. There are no professorial **tours de force,**— since undergraduates are not interested in therapy, there is no longer a section on chemotherapy. In the excellent introductory chapter on the history of bacteriology we note the omission of Lady Mary Wortley Montague's contribution of the unappetizing process of variolation to the story of small-pox immunization. It is not a matter of great importance but we have always had a sneaking admiration for the intestinal stability of the doughty Lady.

BATTALION MEDICS, by Van B. Philpot, Jr.; Exposition Press, 386 Fourth Ave., New York 16, N. Y. 1955. 100 pp., $3.00.

55-5723

This isn't the book we thought we were requesting for review. Instead of a new book on the organization and functioning of a medical battalion, this turns out to be a novel. Its theme is the change of heart a Southern medical officer undergoes while serving in Korea with unsegregated troops. The facts are no doubt true, both as to the Korean experiences of the doctor, and the aftermath in the town below the Mason and Dixon Line. As one who served with troops overseas for nearly three and a half years, and more than a year in the very deep South, this reviewer is not disposed to regard this as "a brilliant first novel." In fact, we suspect it will only serve to increase suspicion on the part of Northerners and resentment in the South. In this day and age, anything that serves to disunite our citizens is playing directly into the hands of the Communists and their fifth column.

BIG DAM FOOLISHNESS, by Elmer T. Peterson; The Devin-Adair Co., 23 East 26th St., New York 10, New

York. 1954. 224 pp., 10 ills., $3.50.
54-10812

Dr. Paul B. Sears, erstwhile Chancellor of Phi Sigma, and now head of the Yale University Conservation Program, contributes the opening remarks to this unusually interesting book. Its theme is the wastefulness and shortsightedness of the Army Engineer program of flood control and reclamation which submerges the fertile valleys under huge man-made lakes, thus eliminating the farming population and driving people away into the cities. Dr. Sears hits the nail on the head when he says of the benefits of science: "The scientist can speak his piece and let the public go to hell if it chooses; or he can turn evangelist — an unhappy role for him—and try, as preachers always have, to urge good behavior in the hope of ultimate reward. Now and then he gets welcome help from a layman of insight, whose profession does not bar him from the rough and tumble of the forum, or better yet, one whose business is to enlighten and inform the public. Such a man is Elmer T. Peterson, whose skill in making information palatable without distorting it is evident in the pages that follow." Unfortunately, the book lacks an index.

BIOCHEMISTRY, by Felix Haurowitz; John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N.Y. 1955. 465 pp., ills., tables. $6.75.
55-8481

Emphasizing the problems that are common in animal, plant and bactriological fields impartially this textbook strikes out in a new direction. It is not confined to any one of the biological disciplines. It opens with basic principles, water and its functions, the mechanism of biochemical reactions, and then only goes on to the traditional treatment of the carbohydrates, proteins and the lipids. Next the author treats of the nucleic acids, porphyrins and their derivatives, mineral metabolism, enzymes, energy balances and nutrition. The book ends with a chapter on human biochemistry. Replacement reactions and energetics, the transfer of energy in biochemical reactions are both comprehensively covered. The author is professor of chemistry at Indiana University. He holds degrees on medicine and science from the German University of Prague, has taught there and at the University of Istanbul.

BIOCHEMISTRY, CLINICAL, by Abraham Cantarow and Max Trumper; W. B. Saunders Co., Philadelphia, Pa. 1955. 738 pp., 54 figs. $9.00.
55-5423

Dedicated to the memory of Albert P. Brubaker, this fifth edition of a standard text has been virtually completely rewritten. Every chapter has been revised, and much new material added on liver function, kidney function, plasma protein abnormalities, nucleic acids in their biological significance, uric acid metabolism, porphyrin metabolism, biochemical aspects of diet, iodine metabolism, lipoproteins, fatty liver, potassium metabolism, acid-base balance, endocrine functional diagnosis, especially thyroid and adrenal. An interesting feature is the dropping from the list of references many original contributions and substituting there for authoritative reviews and monographic discussions of more important topics.

BIOCHEMISTRY, LABORATORY MANUAL OF, by Harrow, Borek, Mazur, Stine and Wagreich; W. B. Saunders Company, West Washington Square, Philadelphia 5, Pa. 1955. 164 pp., 24 figs. $3.00.
55-5203

This is the fourth edition of a laboratory manual which maintains its useful popularity. A casual inspection will convince anyone why. Its compactness makes it easy to handle. On a lab desk is occupies open about the same space as a sheet of correspondence paper. On the inside of the front fly-leaf is a table of atomic weights. The appendix contains directions for preparing standard acid and alkali, solutions and reagents, and indicators. There is also a logarithmic table. There are fifteen chapters of experiments covering carbohydrates, lipids, proteins, enzymes, saliva, milk, gastric digestion, pancreatic digestion, bile, blood, colorimetry, determination of blood constituents, urine, animal experiments, and vitamins.

BIOCHEMISTRY, PRINCIPLES OF, by A. White, P. Handler, E. L. Smith and DeW. Stetten; McGraw-Hill Book Co., 330 Wst 42nd St., New York 36, N. Y. 1954. 1070 pp., 223 ills., $15.00.
53-12053

This is a premedical textbook, which could serve as a reference work for non-premedics as well. The authors hail from Yeshiva University, Duke University School of Medicine, University of Utah College of Medicine, and the Public Health Research Institute of New York. Its approach is somewhat on the synthetic side, as approaches go, in that, for example, chemistry of digestion is correlated with metabolism of foodstuffs, and the chemistry of hemoglobin and respiration go together on the principle of adaptation of structure to function. The fifty chapters are fairly evenly spread out under seven parts, namely: Cells, catalysis, metabolism, body fluids, specialized tissues, endocrines, and nutrition.

BIOLOGICAL CONSERVATION, by John D. Black; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1954. 328 pp., 75 figs., $5.00.
53-11570

This is an entirely new book on the

purely biological aspects of conservation as they particularly affect the United States. The subtitle gives the clue to he author's purpose in putting it together: "Biological Conservation WITH PARTICULAR EMPHASIS ON WILDLIFE." As such it bridges the gap between the more or less theoretical and abstract considerations on conservation and supplements and effectuates them in a practical and concrete fashion. The book has five parts, each subdivided into appropriate chapters. They deal with the basic considerations, the environment (where ecology gets a beautiful work-out), fish and other aquatic animals, birds, mammals. The last part is devoted to a discussion of solving the problem, with particular accent on the federal, state, and private agencies. There are two good appendices,— one devoted to an annotated bibliography, and the other to a guide to films available for a course like this.

BIOLOGICAL SPECIFICITY AND GROWTH, edited by E. G. Butler; Princeton University Press, Princeton, N. J. 1955. 233 pp., plates, ill. and figs. $5.00.

55-5004

This book is the consolidated report of the Twelfth Growth Symposium of the Society for the Study of Development and Growth, which was held at the University of New Hampshire, Durnam, June 14-22, 1953. Among topics discussed are: blood ontogeny and related antigens, immunobiological approach to induction and differentiation, immunogenetics, development of enzyme proteins in plants, specificity in plant sexuality, immunological reactions with bacteria and protozoa, specificity between host and animal parasites, compatibility in tissue transplantation, specificity in growth control, and the specificity of nuclear function in embryonic development.

BIOLOGY, LABORATORY STUDIES IN, by Lawson, Lewis, Burmester and Hardin; W. H. Freeman & Co., 549 Market St., San Francisco 5, California. 1955. 336 pp., 131 ills., 44 tabs., $3.50

This is the Teacher's Edition of a laboratory text for use in those courses which teach botany and zoology in one integrated course. This one is based on Hardin's "Biology, Its Human Implications." Each page is punched and perforated for the student to turn it for correction and then preserve in a three-ring notebook. The forty experiments are divided into six on preliminary ideas, microscope use, cell division, diffusion and plasmolysis and cellular respiration. The next ten are all elementary zoology. Then come four on heredity, growth and differentiation.. One on rocks and fossils follows these. Animals, plants and evidences for evolution come next. Chapters 25 to 31 are devoted to plants, their chief groups and physiology. Next are four on invertebrate animal phyla, the arthropods, chordata; followed by the classification of Man, museum or field study, cycles and food chains, and finally populations and organic evolution. The teacher's copy has a penultimate **avis** to the teacher and lists of lab requisites for each class period.

BIOLOGY IN PHILIPPINE LIFE, by G. W. and F. R. Hunter and L. B. Uichanco; Amrican Book Co., 351 East Ohio St., Chicago 11, Ill. 1954. 518 pp., ills. $3.36.

This is a ten-unit high school textbook designed for use in Philippine schools. In effect it is the P. I. version of "Biology in Our Lives" published by George W. and F. R. Hunter in 1949. The fact that climatic conditions permit out-door study and field observation the year around in all the Islands has had some influence in the organization of the materials presented. For curious youngsters who are not resistant to new ideas, this might be an interesting reference book for schools in the U.S.A. Here they will find a nice comparison between their own conditions both of living and learning in a sister republic.

BIOLOGY, PRINCIPLES OF, by Whaley, Breland, Heimsch, Phelps and Rabideau; Harper & Brothers, 49 East 33rd St., New York 16, N. Y. 1954. 694 pp., 316 figs., $6.00.

54-5515

From "deep on the heart of Texas" comes what appears to be an excellent textbook for beginners in biology, no matter whether they plan on going farther into the science, or whether they are taking one course only in the subject. The illustrations are, for the most part, fresh and original. The six parts of the book are divided into some 47 chapters, as follows: Part one has a one-chapter introduction to biology; part two has twenty chapters of structures and functions; part three has five on the development of organisms; part four has fourteen on the kinds of organisms; part five is a two-chapter treatment of interrelationships of organisms; and part six closes the book with a five-chapter discussion of the continuity of organisms which includes genetics and evolution.

BIOTIC WORLD AND MAN, by L. J. and M. J. Milne; Prentice-Hall, 70 Fifth Ave., New York 11, N. Y. 1953. 588 pp., ills., tabs. $9.25.

Beautifully illustrated, engagingly written, well-planned and comprehensive in scope, this text for general biology is still attracting the favorable notice we predicted in a previous issue of the "Biologist." It is certain that the authors will remove the "Piltdown

Woman," **Eoanthropus dawsonii** from their section on the history of life in subsequent editions.

BIRD BOOK, by Leon A. Hausman; Arco Publishing Co., 480 Lexington Ave., New York 17, N. Y. 1955. 160 pp., 362 ills., 16 pp. in col. $2.50
55-7383

This is a picture album designed to help the average person recognize the common birds of North America. In view of the fact that over 1,400 of the 13,000 to 14,000 species of the world's living birds are found in North America, this book is a welcome addition to our literature. The author is teaching zoology and ornithology at Rutgers, as well as being attached to the New Jersey Experiment Station. His book gives his professional training away in that he first gives outline sketches of 59 bird families in order to familiarize the tyro bird watcher with their general characteristics. Then he goes on to discuss some of the most obvious characteristics of each of the commoner species, giving their scientific and popular names, their habits and favorite locales. We like this book, and have been using it ever since it came for review. In addition to the black and white diagnostic pictures (mostly photographs) there is a 16-page section of Audubon color prints which are suitable for removal and framing, if one has no compunctions about removing them.

BIRDS, HISTORY OF, by James Fisher; Houghton Mifflin Co., 2 Park St., Boston, Mass. 1954. 205 pp., $3.75

A history of birds is so off the beaten track of science history that it must surely have been a labor of love to set about writing it. One is impressed by the amount of information that is apparently available on the subject. If one is captious he might demur to the omission of St. Francis of Assisi whose charm for birds helped to spur interest in the "feathered brethren," or of Bartholemew the Englishman whose "Properties of Things" list 38 in the middle of the 13th century, or the "Ortus Sanitatis," which at the beginning of the 16th lists 121 birds. There are other chapters than those on bird historians which are of greater interest, notably those on geographical distribution, absolute numbers of birds, comparative numbers, changing bird populations, and bird numbers and man. These last chapters find the author, who is a bird ecologist and publicist, on former ground.

BIRDS, HOW TO WATCH, by Roger Barton; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 229 pp., ills. $3.50.
55-6146

In the attempt to answer the question: "How to be a bird-watcher," the author succeeds in more than he attempted. He explains how to watch birds, and then throws in a lot of reasons "Why?" for good measure. Amateur bird-watchers will like this book. The author is president of the New Jersey Audubon Society, and writes a nature column in the papers. He lists all the bird clubs in the U.S.A. by states. Biologists with an ornithological bent will want this book.

BIRDS IN MINNESOTA, WHERE TO FIND, by K. D. Morrison, W. J. Breckenridge & J. D. Herz; Webb Publishing Co., 55 East 10th St., St. Paul 2, Minn. 1955. 157 pp., 5 maps. $2.00
55-5455

With the cooperation of nearly 70 bird watchers, the editors of this spiral-bound pocket-sized volume have compiled some 78 birding areas, all within the confines of the many-laked State. Apparently each single or group of collaborators was given an outline to fill out regarding possibilities of seeing birds in each of the 37 centers. This ingenious device called for the following facts: Direction, highways and trails; Terrain, details on area for observation; Vantage Points, special observation posts liable to guarantee finding birds; Groups, species of birds, seasons to look for them an dwhere seen; Records, if any; Hazards, seasonably impassable trails, etc.; Restrictions, state or federal ownerships, etc.; General, other animals, etc.; References, any publications available about the area concerned.

BIRD NAVIGATION, by G. V. T. Matthews; Cambridge University Press; 32 East 57th St., New York 22, N. Y. 1955. 141 pp., 13 tabs., 32 figs., $2.50

Third of the Cambridge Monographs in Experimental Biology, this volume sets forth the results of much and long authoritative experimentation in the ability of birds to find their way home in spicte of the fact that they are released in entirely unfamiliar terrtory. As an example, a Manx Shearwater (Procellaria puffinus) was taken across the Atlantic and released more than 3,000 miles from its nest, but was back on its eggs within 12½ days. The clarity of its presentation, and the unusualness of its subject matter make this a "must" book for all zoologists, not only ornithologists, and animal behaviorists.

BIRDS OF THE WORLD, by Paul Barruel; Oxford University Press, 114 Fifth Ave., New York 11, N. Y. 1955. 204 pp., ills. $12.50

Translated from the French by Phyllis Barclay-Smith, printed in France, this book aims, as the preface says, "by making pictures talk" to endeavor to reach as wide a public as possible, sportsmen as well as naturalists. There are over two hundred pictures, almost half of them in color. Barruel's work is a good harbinger of future scientific publication which we may hope will come from French scientists. The satisfying thing about this particular volume is the fact that it is all his own work. The text proves that he is no mean naturalist, with a world vision. The photographs show that he is an adept in that field. The color work when he sits down to paint the different groups is Audubonian. His selection of colored or black and white illustrations from sources other than his own is all up to his own high standard.

BIRDS, SOFT-BILLED, by Carl Naether; All-Pets Books, Inc., Fond du Lac, Wisconsin. 1955. 64 pp., 24 col. pl., 17 ills. $3.50

54-11714

This is another of those practical little books which the All-Pets people are producing so regularly. The chapters discuss why keep soft bills, how to feed them, cage requirements, breeding, hints on buying, and an itemized list of possible purchases from among these types. This is not the first Naether book we have announced in these pages. He writes just as interestingly as ever, but then, we all know that he is professor of English at the University of Southern California, so why shouldn't he?

BOTANY, by E. W. Sinnott & K. S. Wilson; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 528 pp., ills., figs. $6.75

54-8807

It is a far cry from the first edition of this text back in 1923 to the present beautifully designed and superbly illustrated volume. A comparison between the volume of thirty-two years ago would lead one to an easily defended conclusion that things botanical have changed in the interim. These changes have made their impact mostly in metabolism, necessitating a complete rewriting of the part on photosynthesis and respiration. There are numbers of other significant changes, subtractions and recombinations of chapter contents which would appear to make the book much more interesting, and, if possible, even easier reading than its predecessors. More than 230 new illustrations have been added, some of them appearing here for the first time. All these features, plus the world-wide reputation of Dr. Sinnott, would be sufficient argument for wishing to inspect the volume. The price that is being asked for it is remarkable when one compares it to other textbooks of like size and content.

—C—

CACTUS, THE FLOWERING, by Raymond Carlson; The McGraw-Hill Book Company, 330 West 42nd St., New York 36, N. Y. 1954. 96 pp., 81 Col. pl., $7.50.

For sheer glorious color of exotic flowers alone, this book would be worth all that is being asked for it. To anyone who has seen the originals in the full glory of their native growth, this book will be a keepsake to refresh the rainbow memory. For the rest of us there can be but the holy envy of those so fortunate. Rarely, if ever, has a monograph on a single genus been able to boast of such an array of color work. It would not have been ordinarily possible if it had not been that the author is editor of "Arizona Highways," our nation's "Magazine Beautiful.' Lest the chance reader of these comments be afraid that this is just another "picture book" we might note that the identifications of the cacti have been checked by Robert H. Peebles, senior agronomist of the U.S.D.A. Field Station, Sacaton, Arizona, who is a recognized authority on Arizona flora.

CARIES RESEARCH, ADVANCES IN EXPERIMENTAL, ed. by R. F. Sognnaes; American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington 5, D. C. 1955. 236 pp., ills. tabs. $6.75

55-7578

In December 1953 there was held at the Harvard School of Dental Medicine, in Boston, a A.A.A.S. co-sponsored symposium on dental caries. Twenty-one authors collaborated in the production of eleven papers on different aspects of tooth decay. Most of the experimental work was done on rats or hamsters. Since this is more of a report-of-progress than a statement of adopted conclusions, we shall have to await developments, which, at this time, appear hopeful.

CELLS AND SOCIETIES, by John Tyler Bonner; Princeton University Press, Princeton, N. J 1955. 234 pp., 46 figs. $4.50.

55-5002

The author of this new work is no new-comer to the field of biological coordination, or philosophy, if you will. Three years ago he published "Morphogenesis, an Essay on Development." He is an associate professor of biology at Princeton. From chapter-studies on howling monkeys, fur seals, red deer, beaver, social insects, army ants, termites, down to the colonial hydroids, he traces back the colonial organization of cells, division of labor, and all the older ideas without, as far as we can see, using the old-fashioned terminology. Dr. Bonner prefers to lump them all together under the unassuming term of fundamental problems, which he reduces to nourishment, reproduction, and coordination of integration. This looks like an excellent integrator for biology students' minds. Having gotten us down to the single cell, he next proceeds to discuss the various organ systems, or physiological necessities in plants and animals.

CELLULOSE AND CELLULOSE DERIVATIVES, Parts I & II, by Emil Ott and Harold Spurlin; Interscience Publishers, 250 Fifth Ave., New York 1, N. Y. 1954. 1055 pp., figs and tabs. $12.00.

53-7161

This is Volume Five in the High Polymers Series. Its editors, and their assistant, Mildred W. Grafflin, are all members of the Research Department of the Hercules Powder Company, Wilmington, Del. The volume first appeared in 1943, and, while most of the concepts enunciated then have stood the test of time, a new edition was in order to meet the expanding applications of the basic facts over the years. The names of the 43 contributing authors form a galaxy of authority which would be difficult to equal anywhere. Part I covers the occurrence of cellulose, its chemical nature and derivatives, structure and properties of cellulose fibers, properties of substances associated in nature with cellulose, e. g. woods, hemicelluloses, lignin, etc. Part II discusses the preparation of cellulose from natural sources, the bleaching and purification of wood celluloses, the properties and treatment of pulp for paper, and the derivatives from cellulose. These volumes are definitive reference work. We await the third part of Volume Five.

CEREBRAL PALSY, by Cyril B. Courville; San Lucas Press, 316 N. Bailey St., Los Angeles 33, California. 1954. 80 pp., 28 figs., $2.50.

The Professor of Nervous Diseases at the College of Medical Evangelists, and Chairman of the Allied Services Committee of the Los Angeles County Chapter, United Cerebral Palsy, here presents a brief history of the baffling affliction, as well as a discussion of its etiology and pathology. There are also chapters on clinical syndromes, diagnosis and evaluation of the palsied child, the elements in prognosis, as well as principles of therapy and practical considerations. For parents who have palsied children one could hardly conceive of a better gift, despite its technicality. For people who are interested in the annual drives for the cerebrally palsied, this could also be a valuable source of information. For the physician who wishes a reference work on this subject there is probably no other to compare with this.

CHEMISTRY OF LIVING CELLS, by Helen R. Downes; Harper & Brothers, 49 East 33rd St., New York 16, N. Y. 1955. 549 pp., figs., tabs. $7.50

55-5035

The outgrowth of twenty years of teaching biochemistry at Barnard College, this volume brings up to date the general chemical processes of all cells, plant or animal. It will be valuable to all in plant or animal sciences, whether premedical, majoring in biology or chemistry, or agricultural majors. The book has three parts. The first deals with preliminary considerations, history and literature, aqueous solutions and the structure of living forms. The second treats of the organic constituents of cells. The last covers intermediary metabolism.

CHERRIES and CHERRY PRODUCTS, by Roy E. Marshall; Interscience Publishers, 250 Fifth Ave., New York 1, N. Y. 1954. 283 pp., 41 figs., 27 tabs. $8.50.

54-8260

The foremost authority on commercial cherry production writes this book from Michigan State College at East Lansing, Michigan. It is volume five in the "Economic Crops Series." The author progresses naturally from a history of the cherry in the rise of civilization to the modern industry of raising, harvesting, preserving, packaging, standardizing and marketing the product. The book is well documented, covering about every phase of the subject except the raising of domestic or garden cherries, which would hardly be a subject for a whole book. Since the latest book solely devoted to the cherry appeared as far back as 1930, there should be many an empty place on library shelves which this one could fill.

COLCHICINE, by A. J. Eigsti and Pierre Dustin; Iowa State College Press, Ames, Iowa. 1955. 470 pp. $6.50

54-7657

This is a complete history of the discovery and the uses of colchicine from 1934 to the middle 1950s. It is the story of two converging lines of research. One was begun in Belgium by A. P. Dustin. Sr., who died shortly thereafter, but his work was carried on by his son who is the junior author of this present work. From a simultaneous start in 1942 by the senior author, the work has gone on, year by year, and he is now with the Colchicine Research Foundation, at Normal, Illinois.

COMMERCIAL FERTILIZERS, by Gilbeart H. Collings; McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. 1955. 617 pp., 193 figs., 193 tabs., $5.00.

54-11315

The latest developments in the discovery, manufacture and use of new commercial fertilizers are here brought up-to-date in this fifth edition of the well-known treatise by the professor of soils at Clemson Agricultural College. The rapid growth in our own as well as much of the world's population is making the problem of feeding the people of the future a sizeable proposition. Books like this are reassuring in that they point the many different avenues of approach there are which lie before us.

CONNECTIVE TISSUES, ed. by Charles Ragan; The Josiah Macy, Jr. Foundation, P. O. Box 575, Packanack Lake, N. J. 1954. 222 pp., 55 figs. $4.25
51-33202

In accordance with the policies of the Foundation which is sponsoring these conferences, this publication represents the fifth and therefore the last on Connective Tissues. There were seven representatives from as many important medical, scientific and research centers at the Conference in Princeton on the 8th, 9th and 10th of February, 1954. There were also four guests, two of them from foreign countries. Their discussions covered the exchange of materials between blood vessels and lymph; interstitial water and connective tissues; and hormonal effects on connective tissues. Incidentally there are some eighteen areas where the Foundation has sponsored these interdisciplinary get-togethers and some have already run through the allotted spans of five conferences. They have been termd by the J.A.M.A. as "Interim Reports of Medical Advances in the Making."

CONSERVING NATURAL RESOURCES, by Shirley W. Allen; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 347 pp., 169 figs. $5.50
54-9689

Written at the college level by an emeritus professor in the department of forestry at Michigan's School of Natural Resources, this book covers the conservation of land and soil, water, forests and grazing, wild animal resources, mineral resources, as well as human powers as natural resources. One sentence with which the preface concludes gives the keynote of the work: "The one best hope for it (the conserving of natural resources) in a democracy is the very fact that our sort of government is founded on the agreement of a great people to live fairly close together." Tied in with this is the subtitle of the book, "Principles and Practice in a Democracy." Thus highly motivated, this book has an appeal not usually found in college texts.

CAPTAIN COOK AND THE SOUTH PACIFIC, by John Gwyther; Houghton Mifflin Co., 2 Park St., Boston, Mass. 1955. 269 pp., 9 ills. $3.50
55-6551

Eleven years ago the author of this summary saw on display in a jeweller's shop in Brisbane, Queensland, a watch and some enamelled cuff-links which had been presented as a token of appreciation to Captain James Cook by the Royal Society. Today, for the first time, we have a chance to estimate the true stature of the man, and realize how much he meant to the opening of the southwest Pacific. This book was a labor of love for a former member of the British Navy who followed much of the Cook itinerary during World War II. He has caught and interpreted much of the spirit of the old explorers, Cook, and his companions, Dr. Banks, the botanist, and Dr. Hawkesworth, ship's surgeon. Of this book our own eulogist of the South Seas, James A. Michener, has well said, "In a remarkably terse and Naval style with just the right number of 18th-century mannerisms, John Gwyther has caught the essential spirit of this great man."

COOK'S VOYAGES, THE BOTANY OF, by Elmer D. Merrill; Chronica Botanica Co., 977 Main St., Waltham 54, Mass. 1954. 229 pp., 13 plates, 22 text figs. $4.75
54-12803

It is merely the long arm of coincidence that in this issue of the BIOLOGIST we summarize Gwyther's "Captain Cook and the South Pacific," as well as the volume listed above. The present volume discusses the botanical aspect of Cook's voyages, not their adventurous side. At that, there is still considerably more of the adventure in Dr. Merrill's work than one might expect. Nor does the author bind himself strictly to the plants discovered by Cook. In his discussion of each group of plants he ranges far afield in correcting those who take it easily for granted that many of the endemic forms were known in Europe before the age of exploration. The author's subtitle, "—and Its Unexpected Significance in Relation to Anthropology, Biogeography and History," give one the clue to some interesting reading.

CRYPTOGAMIC BOTANY, VOLS. I and II, by Gilbert M. Smith; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 546 & 399 pp., 311 & 254 figs. $8.50 and $8.00
54-8808

The editor of "The Biologist" learned his college laboratory class techniques from assisting the author of this work, away back in the "20s" at the University of Wisconsin. Each successive production from Dr. Smith's pen has therefore had a special attraction. The first edition of this work appeared in 1938. The changes brought about in the past seventeen years have necessitated a complete overhaul of the entire text. —This is a delightful answer to those who feel that cryptogamic botany is static.—Since these volumes are intended as textbooks for those students who, having had an introductory course in botany, are interested in the plants below the spermatophytes. For such as are not interested in graduate-level detailed courses in the various plant phylum morphologies, and as a general survey, this should prove a desirable coverage of the field. Under these conditions the coverage can hardly be expected to be exhaustive. One should be satisfied that they are neither superficial nor sketchy. Dr. Smith has skillfully avoided these latter defects by choosing more important,—and in some cases extremely unusual and interesting,—type forms to represent the particular group.

CYTOLOGY, ANALYTICAL, ed. by Robert C. Mellors; Blakiston Division, McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. $15.00
54-8802

From the division of Experimental Pathology, Sloan-Kettering Institute for Cancer Research and Pathology Laboratories, Memorial Center for Cancer and Allied Diseases, and Graduate School of Medical Sciences, Cornell University Medical College, comes this collection of nine top-level research papers, with an introduction by Dr. Francis O. Schmitt. It has five papers on methods in the optical spectral region, and four on methods using electrons, radioactive isotopes and X-rays. The peculiar method of paging makes it impossible for us to list the number of pages, illustrations or tables as is customary in this publication. As an example, the Feulgen-Rossenbeck Nuclear Technique for Desoxypentose Neucleoproteins is discussed on page 2/8, and Submicroscopic Cytoplasmic Particulates on page 6/51. The situation is slightly relieved in that the 30-page index covers the entire series of papers quite accurately. Graduate students in cytology with a medical background will find it a comprehensive and stimulating insight into the progress of modern research at the very highest levels.

—D—

DANCING BEES, by Karl Von Fritch; Harcourt Brace & Co., 383 Madison Ave., New York 17, N. Y. 1955. 183 pp., 30 pl., 61 figs. $4.00
55-5316

This book is the biggest four dollars worth on the biological market right now. It is safe to say that while Fabre made the bee famous, and Maeterlinck idealised it, von Frisch has explained it. And his patient and ingenius experiments should just about qualify this work as an entomological classic. There are too many unusual things in this book, too many behavior factors, and too many ecological leads to run down for any one to attempt to put them into one short summary. It is sufficient to state that the name of von Frisch has gotten into the literature of insect behavior, and it's there to stay.

CHARLES DARWIN, by Ruth Moore; Alfred A. Knopf, 501 Madison Ave., New York 22, N. Y. 1954. 213 pp., $2.50
54-7221

The author, who is a rarely intelligent journalist, favored us with an interesting book a year or so ago, "Man, Time and Fossils." As a result of interests stirred up in that production, she has gone on to produce another interesting item, a sympathetic study of Charles Darwin. Of the nineteen original works of Darwin listed in her "Note on Sources," at least six are definitely and almost exclusively botanical. Not only is this fact generally ignored, but it justifies the French Institute in its electing him to the "botanical section." It also makes Darwin's remark on this occasion a bit on the amusing side. On this occasion he wrote to Asa Gray: "It is rather a good joke that I should be elected to the Botanical Section, as the extent of my knowledge is little more than that a daisy is a Compositous plant and a pea a Leguminous one."

DEEP SEA BIOLOGY, ASPECTS OF, by N. B. Marshall; Philosophical Library, 15 E. 40th St., New York 16, N. Y. 1954. 380 pp., 5 col. pl., ills. $10.00

Adequately bibliographied and well illustrated, this is something more than the usual popular book about the sea. It opens with an unusually informative chapter on the history of deep sea biology, followed by chapters on deep sea exploratory techniques, the deep sea environment, oceanic plants, and animal life in the deep sea. From here on its chapters go into special problems, such as food chains, sense organs, sound, light, and life histories of deep sea animals. This book can be recommended as a college library reference work. Very expensive, however, —it costs half as much in Britain.

DESERTS, BIOLOGY OF THE, ed. by J. L. Cloudsley-Thompson; Hafner Publishing Co., 31 East 10th St., New York 3, N. Y. 1954. 224 pp., ills. $3.00

This book records the results of a Symposium on Hot and Cold Deserts organized by the London Institute of Biology in 1952. It is published in cooperation with UNESCO. It is composed of 28 papers by acknowledged leaders in the field of Ecology, or geography. The six French papers are by Monod, Emberger, Vayssiere, Balachowsky, Bernard, and Sergent. The English papers are by Debenham, Bagnold, Shotton, Williams, Boyko, Good, Zohary, Reichert, Uvarov, Butlin and Postgate, Stebbing, Tumble and Wodroffe, Manton, Phillips, Bodenheimer, Wright, Schmidt-Neilsen, Marsh, Weiner, Edholm and Brunt. Climate and soil are ecological factors that are the same, yet different, the world over. This book is interesting because it gives the European slant on ecological problems.

DEVELOPMENT, ANALYSIS OF, ed. by B. H. Willier, P. A. Weiss and V. Hamburger; W. B. Saunders Co., 218

W. Washington Sq., Philadelphia 5, Pa. 1955. 735 pp., 248 figs. $15.00
55-5565

Twenty-eight authors make up the panel which under the editors listed above, produced this monolithic book. It all started in informal meetings held at the Marine Biological Laboratory in Woods Hole and thereabouts, particularly among the Barnstable sand dunes. The group took the name of "The Sandpipers" from the most common audience they had on their peripatetic perigrinations. While the book would require a genius of a teacher to make its wealth of facts available for a beginning class in embryology, it should certainly be invaluable for any advanced students in the subject. Jane Oppenheimer's introduction, "Problems, Concepts and Their History," is a 24-page treatise which no professor of the history of biology can afford to ignore. The other sectional divisions are: methods and techniques; cellular structure and activity; nucleus and cytoplasm in development; embryogenesis in preparatory and progressive phases; special vertebrate organogenesis; energy exchange and enzyme development during embryogenesis; ontogeny of immunological properties; ontogeny of endocrine correlation; size determination; metamorphoses; regeneration; and teratogenesis.

DEVELOPMENTAL ANATOMY, by Leslie B. Arey; W. B. Saunders Co., Philadelphia, Pa. 1954. 680 pp., 630 ills., $9.50
54-6089

A third of a century ago this reviewer took a course in embryology at an eastern university and one of his textbooks was by Prentiss and Arey. It is good to see that the then junior author is still in the educational game batting them out as neatly as ever. That this sixth edition is a neat performance is putting it mildly. There are some 1552 separate drawings, many of them new or redrawn. A new section on the 72-hour chick embro has been added. The use of larger type for the important and more general statements, leaving additional information to smaller type is a desirable feature. The subdivision of the older and unwieldier long discussions into smaller chapters is another improvement. We like the summary of the recapitulation theory particularly: "All that can be maintained is that the development of any individual may more or less recapitulate the style of development that its ancestor used. Stages may be omitted, sequences altered, larval specializations interpolated and new structures developed."

DIAPAUSE IN INSECTS, THE PHYSIOLOGY OF, by A. D. Lees; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1955. 151 pp., 25 figs., 7 tabs. $2.50

Only professional entomologists will be likely to remember Dr. Wheeler's term "diapause" introduced in 1893, and subsequently modified by different authorities. Whether it means arrested development, gonotrophic dissociation, dormancy, hibernation, or quiescence, all its physiological phases are here discussed by Dr. Lees, who happens to be a member of the Agricultural Research Council, Unit of Insect Physiology at Cambridge University. This book is the fourth in the series of the Cambridge Monographs in Experimental Biology.

DISEASE, ANIMAL AGENTS AND VECTORS OF HUMAN, by Ernest C. Faust; Lea & Febiger, Washington Square, Philadelphia 6, Pa. 1955. 660 pp., 216 ills., 9 pl., 12 tabs. $9.75
55-6379

With a number of books on human helminthology, and clinical parasitology to his credit, Dr. Faust now presents the latest addition to his achievements in a volume devoted entirely to the disease conveyors in the animal world. In addition to the invertebrates: protozoa, nematodes, cestodes and trematodes, arthropods, etc., he includes in this work the fishes, reptiles and mammals which are harmful to man. This, we believe, is rather new. The treatment of each form is more or less traditional: etiology, epidemiology, pathogenesis, symptomatology, diagnosis, treatment and control are all considered. As such the book should have a wide market among zoologists, epidemiologists, pathologists, physicians, laboratory diagnosticians, and public health workers.

DISEASES, THE HISTORY AND CONQUEST OF COMMON, ed. by Walter R. Bett; University of Oklahoma Press, Norman, Oklahoma. 1954. 334 pp., $4.00
54-10060

A panel of seventeen distinguished physicians have collaborated in the production of this work, which runs through communicable diseases, influenza and other pulmonary infections, rheumatism and arthritis, heart disease, the social diseases, endocrine deficiencies, gall stones, epilepsy and cancer, not to say even, malingering. The discussions are brief, but seem to cover the main points quite thoroughly. Although the editor is British, there are five papers by Americans.

DISNEY'S LIVING DESERT, by Jane Werner and the Studio Staff; Simon and Schuster, Inc., Rockefeller Center, New York 20, N. Y. 1954. 124 pp., ills. $2.95

Those who have seen any of the Walt Disney nature study films and have been impressed by them will want to preserve their memory in this slim but beautifully colored volume. Color is rampant, but science is not, nor was it meant to be. These illustrations are from the films, and all films must have happy endings. Hence, the grim reality of natural give and take is soft-pedalled in the favor of movie audiences. As such this book will be in demand for children's libraries, where it will do a lot of good in diverting their attention to the actual romance of real life and away from the fictions of comic books.

DISPERSAL IN FUNGI, by C. T. Ingold; Oxford University Press, 114 Fifth Ave., New York 11, N. Y. 1953. 197 pp., 90 figs., 6 tabs. $2.90

Almost as conveniently small as one of the Methuen Series, this little British book packs a lot of interesting scientific knowledge into a small space. It is not a plant pathologist's nor a taxonomist's manual. It aims to picture dispersal of fungi as living organisms, **and no more than that.** Those of us who have not been able to see the woods for the trees in more worldly technical books can get a pretty clear picture of this dispersal operation here, and then go on, if we are so moved, to the aerobiological, or pathological, or ecological, implications of the fungal world on the march.

DRINKING IN COLLEGE, by R. Straus and S. D. Bacon; Yale University Press, New Haven, Conn. 1953. 221 pp., $4.00

53-7773

Anyone who is biologically interested in student behavior can not ignore the problem **par excellence** of modern higher education, student drinking. While a lot of it is more or less pose, along with the "Boola Boola," "Alt Heidelberg," "Brown October Ale," sort of nostalgia, a reawakened civic consciousness and interest in the problems of the more or less "forgotten" man, — and woman, — among our student population, and the realization that acquiring drinking habits is disastrous for some types of characters, all focussed a lot of attention on this report when it first appeared. Emanating from the Yale Center of Alcoholic Studies, it was hoped by some that it would offer some cogent plan to control the situation. The Straus-Bacon report did nothing of the sort. It merely codified and analyzed the data accumulated from some 27 college and university campuses, and let the chips fall. It would be interesting to discover what a Harvard Committee would unearth about the impacts of this report on the (unknown) colleges concerned, and what solutions, if any had been arrived at.

DRUG ACTION IN CHEMOTHERAPEUTIC RESEARCH, IONIC INTERPRETATION OF, by A. V. Tolstoouhov; Chemical Publishing Company, 212 Fifth Ave., New York 10, N. Y. 1955. 276 pp., 77 tabs., 12 figs. $10.00

Originating in the laboratories of the Nepera Chemical Company and with the cooperation of various New York and Brooklyn hospitals and institutions, this book aims to deemphasize the structural characteristics of medical agents and to bring emphasis on their physical aspects. Toxicity, for example, may be predicted on the basis of the physical constants of drugs. Carried to its logical conclusions, this book should aid in organizing pharmaceutical research so as to avoid random synthesis and testing to find one drug of permanent value. In the words of Lord Kelvin, quoted by the author: "If you can measure that of which you speak and can express it by a number, you know something of your subject; but if you cannot measure it, your knowledge is meagre and unsatisfactory."

—E—

ECOLOGY, PLANT, by Unesco; Columbia University Press, 2960 Broadway, New York 27, N. Y. 1955. 377 pp., maps, charts, pl. $8.00

Published in France for UNESCO's arid zone research, this volume is sixth in a series of reviews of research in various countries seeking to find ways and means ultimately to make the deserts bloom like the proverbial rose. Thus far arid zone hydrology, and the use of saline (ground) water have been covered, the former both in an issue of reviews of research, and in the Ankara Symposium. Ecologists who wish to get a first-hand study of the arid regions and their vegetation would do well to invest in this volume. Countries covered include Afghanistan, India, Pakistan, Iran, Israel, Turkey, Latin America, Australia, Irak, Jordan, Lebanon, Saudi-Arabia, Syria, Yemen, Egypt, Eritrea, Libya, Soudan, Angola, SW Africa, Becuanaland, Union of South Africa, NW Africa, U.S.A., Canada, Tropical East Africa. The book does not mention any of the Iron Curtain countries, nor any part of the U.S.S.R., probably because in that smiling land of plenty there are no longer any arid zones. There is an index (12 pp., 3 cols. per page) of plant names, and a separate subject index for the whole work. Dr. W. G. McGinnies of the Central States Forest Experiment Station, Columbus, O., did the USA and Canada study.

EMBRYOGENESIS IN PLANTS, by C. W. Wardlaw; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 1955. 381 pp., 84 figs. $8.00

Dr. Wardlaw is Professor of Cryptogamic Botany at the University of Manchester. His purpose is to summarize in one volume all the more recent research that has occurred in the field of plant embryogeny from the algae to the angiosperms. This puts this work into a class of desirable references which is all the more important because the author has tried to keep the dynamic and the experimental aspect to the fore as far as possible. The bearing of embryogenesis on evolutionary and phyletic theory is also taken into consideration. The book, therefore, contains interesting matter for all botanists.

ENDOCRINOLOGY, GENERAL, by C. D. Turner; W. B. Saunders Co., 218 W. Washington Sq., Philadelphia 5, Pa. 1955. 553 pp., 171 figs., $8.00
55-6334

This is the second edition of a more or less controversial book which first appeared in 1948. It was written in an attempt to dissociate the idea of endocrinology from the thralldom of continual and intentional identification with clinical medicine. That the author's venture turned out to be a powerful contribution to the cause is testified by the number of colleges in which endocrinology is offered as part of the general zoological course-program, entirely separate from, and bearing no relation to, any medical or premedical program. In this second edition the whole of the earlier book has been revamped. Old chapters have been eliminated or cut down and recombined with others, new chapters have been inserted, and step by step with these developments has been a weeding out and an insertion of new references in the place of older citations in the bibliographies attached to each of the 14 chapters. Dr. Turner is Lecturer in Biology at the Tokyo Army Education Center, Tokyo, Japan.

ENTOMOLOGY, APPLIED, by H. T. Fernald and H. H. Shepard; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 385 pp., 269 figs. $7.00
54-11266

This is the fifth edition of a work which first appeared in 1921 under the direction of the late Dr. H. T. Fernald of the University of Massachusetts. It was then aimed in part at the "ag" students who were in need of an entomology course as part of their general program. It was also designed as an introductory course for those who hoped to specialize in entomology later on. The Editor of "The Biologist" came under the former group back in the early '20s and this was the textbook we used. It is good to know that even though Dr. Fernald no longer is with us, his work has found a sympathetic cooperator who has revised the earlier editions, brought the text up to date, most of it before Dr. Fernald passed away. The order of treatment has been retained so that teachers who have their laboratory materials all stored away will not be inconvenienced by radical changes. This is a consideration which many book revisers are not thoughtful enough to envision.

ENZYMOLOGY, ADVANCES IN, Vol. 16, ed. by F. F. Nord; Interscience Publishers, 250 Fifth Ave., New York 1, N. Y. 1955. 584 pp., tabs., diags., $11.00
41-9213

This 16th volume in the impressive "Advances" series contains eight papers, an author index, a subject index for this volume, and a cumulative index for all sixteen. The papers include one on the structure of coenzyme A, by J. Baddily; W. H. Seegars on the coagulation of the blood; another on the comparative biochemistry of the Meister's paper on tansamination; one phenolase complex, by H. S. Mason; A. on intermediates in amino acid biosyntehsis by B. D. Davis; A. S. Szent-Gyorgyi on structural and functional aspects of myosin; W. H. Fishman's on beta-glucuronidase; and the joint paper by V. G. Allfrey, A. E. Mirsky and H. Stern, on the chemistry of the cell nucleus.

ENZYME CHEMISTRY, OUTLINES OF, by J. B. Neilands, P. K. Stumpf and R. Y. Stanier; John Wiley & Sons, 440 Fourth Ave., New York 16, N.Y. 1955. 315 pp., 135 ills. $6.50
55-6954

Designed to serve seniors and graduates entering into enzyme chemistry, and as a research reference for more advanced workers, this joint work might aptly be called "Operation Biochemical, University of California," since it is the joint product of three members of that institution's staff. The book is adapted to a one-semester course for students well-grounded in chemistry and physiology.

EXOTIC PLANTS, by Alfred B. Graf; Julius Roehrs Co., Rutherford, N. J. 1955. 96 pp., ills. Paper $2.50 De Luxe 4.00

Having had some interesting results in the growing of exotics from seed in our laboratory we were naturally interested in a "rave" notice of this publication which appeared in a recent gardening publication. After seeing and studying "Exotic Plants" carefully, we find it hard to resist becoming sloppily dithyrambic over it ourselves. First of all, it's a plant catalog. Secondly, it's not in color. Thirdly. plants are listed by their taxonomic names based on Bailey with popular names as synonyms. Fourthly, and to our mind most desirably, there is an alphabetic code which identifies each species as to its optimum temperatures, habitat, soil, light conditions, and moisture relations. Fifthly, all plants are listed alphabetically except for a few specialized groups,— the begonias, bromeliads, ivies, marantaceae, orchids, philodendrons, saintpaulias, and the succulents with cacti. In addition, there are helpful pages on climatic conditions in the tropics and subtropics, house-plant insect enemies, and 17 pages of photographs, a sort of pictorial travelogue, of tropical Americas, Africa, Asia and Australasia. If you can afford to grow unusual things, this it IT.

EVOLUTIONARY THOUGHT, THE UNLEASHING OF, by Oscar Riddle; Vantage Press, 120 W. 31st St., New York 1, N. Y. 1955. 414 pp., $4.50
54-10246

Intellectual hyperpituitarism demonstrated by the eloquent and dynamic personality whom "Time" once chose as "one of the half-dozen top biologists of the U. S." The author's use of references is adroit. There are so many he **might** have used if they had served his purposes better.

—F—

FACTS OF LIFE, by C. D. Darlington; The Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1955. 467 pp., 19 figs., 9 plates, 7 tables. $7.00

Dr. Darlington's eminent position as a cytologist and geneticist, as Sherardian Professor at Oxford, and his work with Bateson in the '20s, gives this book a measure of authority which most scientists would be unwilling to concede to one of their number who tries to sort out the tangled results of modern research into something like a reasonable philosophy of biology. That Dr. Darlington has reached a deterministic position will be no secret to the reader. His use of modern evidences produced by the world's scientific research in the last few decades makes the book more than passingly interesting.

FERNS AND FERN ALLIES OF MINNESOTA, by Rolla M. Tryon, Jr.; University of Minnesota Press, Minneapolis 14, Minn. 1954. 166 pp., 207 figs., 85 maps. Trade $4.00, Text $2.75
54-8211

Another State has rallied around with a new taxonomy of its offerings in ferns and fern allies. Most of the type illustrations are in silhouette. Only where the arrangement of sori, etc., is a decisive factor in diagnosis, has there been any attempt at line drawings. Each of the varieties listed in the book is accompanied by a miniature map of Minnesota with the location of collection spots indicated. Anyone who has any of Minnesota's ferns in his herbarium will want to have this book.

FERNS AND FERN ALLIES OF NEW MEXICO, by H. J. Dittmer, E. F. Castetter, Ora M. Clark; University of New Mexico Press, Albuquerque, New Mexico. 1954. 139 pp., 55 figs. Paper, $1.00

As the authors so appositely remark in the preface to their book, most people who are unacquainted with the massive bulk of the Sange de Cristo Range, will be surprised that the state of New Mexico has any fern flora at all worth writing a book about. The authors have been charmingly frank in admitting a number of species credited to their state as having yet to be discovered in it. At that, however, they are able to list some 7 families, 24 genera and 75 species actually found, or at least known to exist on the borders of the state and therefore presumably yet to be discovered. The drawings by Jeanne R. Janish are refreshingly clear, and new.

FERNS OF TENNESSEE, by Jesse M. Shaver; George Peabody College for Teachers, Nashville 5, Tenn. 1954. 502 pp., 243 figs. $6.00

There is something historical about this book in that it marks for the first time the publication in book form of a manual on the ferns of Tennessee. For all of which the author, who is emeritus professor of Biology at George Peabody, is to be congratulated. To a certain extent, the book represents his own life work. Many of the forms described in the book being his own discoveries. Tennessee occupies five of the Fennemann geographic provinces, a distinction that few especially among the southern states can claim. From the high eastern mountains with a Michigan-like climate down to the western lowlands along the Mississippi, and typically coastal cotton state warmth is a rather unique range. The soils are as various, and the type of vegetation follows accordingly. This should be a helpful book to anyone collecting or trying to identify specimens collected anywhere from the Ohio to the Gulf.

FERMENTATIONS, INDUSTRIAL, ed. by L. L. Underkofler and R. J. Hickey; Chemical Publishing Co., 26 Court St., Brooklyn 2, N. Y. 1954. 565 pp., 72 figs., 55 tabs. $12.00

Fermentation is one of the oldest chemical processes known to man. In recent years it has been applied to so many industrial processes that the connection between modern industrial use and the ancient uses have been lost sight of. Nineteen authors contribute the 17 papers presented in this first volume of the series. The first part is devoted to alcoholic fermentations and their modifications, the second to yeast production, the third to butanol-acetone fermentations, and the last to the production of organic acids like lactic, citric, gluconic, fumaric, itaconic and acetic. The contributors are scientists connected with the Madison Forest Products Laboratory, reputable wineries, distilleries, sulphite pulp makers, milling companies, etc.

FLORA, ORIGIN AND DISTRIBUTION OF BRITISH, by J. R. Matthews; Longmans Green and Co., 55 Fifth Ave., New York 3, N. Y. 1955. 173 pp., 6 maps, 5 tabs. Text ed. $1.80, Trade ed. $2.40

The "right little, tight little isle" of Britain has a widely studied flora that which have carried the Union Jack to the farthest corners of the globe. This book is a study of past and present distribution of what are now known as "British plants." The author is Regius Professor of Botany at the University of Aberdeen.

FLORA OF THE PACIFIC STATES, ol. III, by Leroy Abrams; Stanford University Press, Stanford, California. 1951. 866 pp., 1981 ills. $17.50

This third volume in Dr. Leroy Adams' monumental work covers the rest of the Choripetalae and the Sympetalae from the **Pyrolaceae** to the **Scrophulariaceae**, some 55 families. It has become established from the widest different parts of the globe, thanks to the trade, commerce and carriers begins with genus **Geranium** and ends with genus **Cordylanthus** in the Figworts or **Scrophulariaceae.** The roving disposition of our population, scientific as well as unscientific, the exchange of students as well as student materials, the drifting of seeds with every passing freight car on the railroads, or "semi" on the highways, makes a complete coverage of the trans-Rocky flora imperative. Three volumes of the valuable set are completed. We await with anticipatory pleasure the final volume or volumes. For the benefit of those who have no access to Volumes I and II we list their prices here: $12.50 for the first, $15.00 for the second.

FLOWER BOOK, MACMILLAN WILD, by C. J. Hylander; The Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1954. 480 pp., 232 col. plates, 4 figs. $15.00

For those with a modicum of botanical techniques, sharp eyes, a sense of color, and an interest in wild flowers, this is what the doctor ordered. The artist who made the color plates, Edith Farrington Johnston, has an unmistakable flair for catching the plant just as one sees it, not as the textbook diagrams give it. Dr. Hylander's descriptions include the common names, the taxonomic name, (based on the 1950 edition of Fernald's Gray) and the family to which each specimen belongs. The number of color plates listed above is confusing and does not do the book full credit. Most of the plates show at least two, if not three of the more than five hundred wild flowers which may be found from the East Coast to the Rockies, and from Florida to Southern Canada. We have so far missed only teasel which grows wild hereabouts, and **Pinguicula** and **Mimosa pudica** which we found in profusion in Mississippi. On the other hand we were delighted to find **Hymenocallis occidentalis** beautifully figured. (It has been blossoming every year in our botany lab since we pulled up a bulb and brought it along from a swamp near Violet, Louisiana.)

FLOWERS, FIELD BOOK OF AMERICAN WILD. by F. Schuyler Mathews, (Norman Taylor rev.); G. P. Putnam's Sons, 210 Madison Ave., New York 16, N. Y. 1955. 601 pp., 300 ills., 30 pl. $5.00

55-5778

This pocket guide was first published in 1902 and contributed much to awakening an interest in the wild flowers among the rank and file of those who had no access or interest in the fine points of plant taxonomy as represented in the average college botany program. The increase in surface transportation due to the rise of auto traffic has helped materially in the demand for a revised and up-to-date Matthews pocket manual. While it is a bit too thick for pocket transport, it will fit nicely in the knapsack or the glove compartment of a car. Both Gray, and Britten and Brown have been used as revisionary guides. Where there was a division of opinion, the latter authority was followed.

FLOWERS, HIDDEN LIFE OF, Noailles and Guilcher; Philosophical Library, 15 East 40th St., New York 16, N. Y. 1954. 93 pp., 102 photos, 10 diags., $4.75

For a long time Roger's book on "Tree Flowers" has been the classic on structural adaptations to pollination, at least photographically, in American trees. Now comes a pair of Frenchmen with a real genius for photography and dramatic language to tell the story of flower parts and functions, especially in pollination. Types used are the corn-poppy, barberry, primrose, white campion, birth-wort, maize, mallow, chestnut, black pine, and the sage. Seldom has there been a better presentation of biological processes, never has there been so beautifully and effectively illustrated one. Eminently worth having around the classroom.

FLUORIDATION AS A PUBLIC HEALTH MEASURE, ed. by James H. Shaw; American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington 5, D. C. 1954. 232 pp., ills., tabs. $4.50, to AAAS members $4.00

54-12546

This would appear to be **the** definitive reference work wherever the question of public health involves the fluoridation of water supplies. Its editor is a member of the Staff of the Harvard School of Dental Medicine. He has assembled eleven individual or jointly written papers by twenty-one responsible authors whose positions in American medicine and public health should be beyond suspicion. This book is, therefore, a **must** book on all biological library shelves, particularly where physical education or public health has become a part of the curricular offerings.

FORAMINIFERA, INDEX TO THE GENERA AND SPECIES OF, by Charles D. Sherborn; Smithsonian Institution, Washington 25, D. C. 1955. 485 pp. $...

This is a reprinting of the combined 1893 and 1896 parts of the classic work which was originally published by the Smithsonian, although the author was an Englishman. Now that Hans Thalmann is readying for publication a monumental work of the Foraminifera from 1890 to 1950 it is a singularly appropriate time for the original work to be reprinted, since the more recent work will not back-track over the fields so admirably covered by Sherborn. American science owes a debt of gratitude to the Smithsonian for doing just this sort of thing,—something that the trade printers would not consider worth running the risk of taking a loss on printing. Needless to say, the biological library which aims to be complete in its taxonomic holdings will ill afford to miss this volume any more than the forthcoming **magnum opus** of Thalmann.

FORESTS, OUR NATIONAL, by Bernard Frank; University of Oklahoma Press, Norman Oklahoma. 1955. 238 pp., 48 photos. $4.00

55-6362

Prefaced by a thought-provoking introductory discussion by Supreme Court Justice William O. Douglas, this book is a serious discussion of what we have now in our forest resources, of what we used to have, and what our descendants are going to have in the years that are to come. The author is Assistant Chief of the U. S. Forest Service. He knows whereof he writes so his book should be a valuable addition to any but the most specialized of libraries. There is a map showing all the national forest areas, and two appendices are added, the first covers national forest recreational and scientific areas state by state. The second consists of four tables and a chart. These cover the areas of national forests by states, the stream flow from western national forests, the number of millions of acres devoted to grazing in national forests, the values of national forest properties, and the chart of the organization of the National Forest Service.

FOREST, THOSE OF, by Wallace B. Grange; The Flambeau Publishing Co., Babcocks, Wisconsin. 1953. 314 pp. $4.75

53-12819

It is not often that one who knows the forest and all its inhabitants is able to tell about it. In Wallace Babcock, conservationist, wildlife manager, and grouse raiser, we find the happy combination of a scientist, a writer and a philosopher all at once. He writes of the forest at all seasons of the year as if he had lived all his life under the trees, and knew no other home. There is something other-worldly about this book that grips you—if you have even fallen under the spell of what the poet calls "God's first temples," and you lay the book down, only to come back to it, with a sort of unemotional nostalgia. Just what achieves this effect is hard to decide. It may be the continuous use of the present tense. In this book there is no past or future. Like Eternity, it is only of the everlasting **now.** It may derive its otherworldliness from the fact that humanity is singularly absent. When you open the book Time seems to stand still. You are alone with the woods and its inhabitants, not one of whom is Man. This, we suspect, is the real secret of the charm which has enthralled so many of its reviewers.

FOSSIL PLANTS, INTRODUCTION TO STUDY OF, by John Walton; Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1954. 201 pp., 138 figs. $4.75

This is the second edition of a standard text which first emanated from the University of Glasgow in 1940. It has been substantially revised, with considerable retention of the excellent features of the original. Among the desirable ideas developed in this textbook are: a chapter on the nature of fossil plants and investigative techniques in studying them. Chapters Two to Sixteen inclusive are devoted to a phylum by phylum discussion of the more important genera and species. The last chapter is taken up with a review of the floras and climates of the past. The book has a bibliography which is mostly pre-1940. We find no reference to carbon-dating.

FROM PAMPAS TO HEDGEROWS AND DOWNS, by Richard E. Haymaker; Bookman Associates, 34 East 23rd St., New York 10, N. Y. 1954. 398 pp., $5.00

This study of W. H. Hudson is a comprehensive critical study of an author whose name, the author thinks, should rank with White and Thoreau as a literary agent of Nature. His approach to his subject is more from the literary than the scientific viewpoint. Hence he rapidly sketches in the salient details of Hudson's life, following it with an equally rapid discussion of the out-of-door essay from the Greeks up to Burroughs, Thoreau, and Ruskin. Then follow chapters on the development of Hudson's style, his artistry, his feeling for landscape and figures, his novels and tales, and a concluding chapter on Hudson as he called himself, "the religious atheist." Apropos of this last we might say that Hudson was too much of a poet at heart, to be anything else than a spiritual pantheist, or at least a deist. The book is scholarly, but not difficult reading. Those who know Hudson for his ornithological works will appreciate this belated appreciation of his talents.

FUNGI, THE GENERA OF, by F. E. Clements and C. L. Shear; Stechert-Hafner Inc., 31 East 10th St., New York 3, N. Y. 1954. 496 pp., 58 plates. $15.00

This is the second printing of a classic work which has been out of print for years, to the point where it had almost become a collector's item. It has a glossary of English as well as Latin terms, the original bibliography, and a 34-page index. The publishers are to be congratulated for filling a need which no other monograph quite meets.

—G—

GALEN OF PERGAMON, by George Sarton; University of Kansas Press, Lawrence, Kansas. 1954. 112 pp., $2.50
54-8112

The American **doyen** of science historians shows us in this slim book, how science history ought to be written. Lest anyone be mistaken, let it be said, here and now, that this book is not merely a biography of a famous character in the history of medicine,—and therefore, biology. This book is more. It includes an appraisal of the times, of the **locale** of the author's writings, and of the interrelations,—and antipathies,— of the physicians, surgeons, pharmacists, philosophers, historians and philologists,— among all of whom the seer of Pergamon might in some way be reckoned. This appraisal of Galen and his times is a book that merits a place on every college or university library shelves. It will be caviar to the general to other biologists, unless they have a breadth of culture which takes in the history of their science as well.

GARDEN BOOK, Better Homes & Gardens; Meredith Publishing Co., Des Moines, Iowa. 1954. 480 pp. $3.95

The first edition of the now familiar loose-leaf binder, with its stout yellow divider tabs, was so successful that the publishers of BETTER HOMES AND GARDENS have done a repeat. The twenty sections cover just about all the phases of front or back yard gardening anyone could desire. The first ten are aesthetic. Then come garden tools and devices, construction, soils, vegetables, fruit, pests and diseases, house plants, eeds and propagation, and reminders. The wind-up just before the index is devoted to weights and measures, frost zone maps and art credits, which last are certainly due to some of the finest photography and art work one could wish for. If one has a few pet ideas which were embalmed in the 1951 edition, there is apparently no good reason why one couldn't "lift" them from the older issue and insert them in the new under their proper paging in the index.

GARDEN PLANTS, THE CARE AND FEEDING OF, ed. by F. P. Cullinan and R. Coleman; The National Fertilizer Association, 616 Investment Building, Washington 5, D. C. 1954. 184 pp., 65 ills. $3.00

The chapter titles in this symposium-type book run as follows: how plants grow; if you want a good lawn; shrubs for home grounds; trees for home grounds; house plants; fertilizers for garden flowers; how about a vegetable garden; and small fruits for the home garden. Since it is the joint production of the American Society for Horticultural Science and The National Fertilizer Association, and the chapters have been contributed by sixteen different authors working in pairs, one might expect some disparity in treatment of the various chapters. Such, however, is agreeably not the case. Each chapter is preceded by an outline of the subjects to be discussed, there is a free use of charts and maps, the bibliography seems adequate for a popular book, and the use of colored illustrations, especially to demonstrate nutrient deficiency is prodigal in the extreme. For the home gardner with limited library resources this book would be hard to beat.

GARDENS OF THE ANTILLES, by John V. Watkins; University of Florida Press, Gainesville, Florida. 1952. 244 pp., 21 ills., $3.75

Ecologically, horticulturally, and viatically interesting, this book is laid down with a feeling of exasperation. One wishes it were not so short, and that the really unusual illustrations were doubled or tripled in number. The author has a background of experience in the Arnold Arboretum, and in horticulture in our own South which makes him an ideal traveller, athirst for information regarding the possibilities and products of the soil, what there is of it, on the islands to the southeast of the continental U.S.A.

GARDEN SPICE AND WILD POT-HERBS, by W. C. Muenscher and M. A. Rice; Cornell University Press, 124 Roberts Place, Ithaca, New York. 1955. 211 pp., 56 pl., 1 tab., $5.75

The senior author of this new book, a Professor Emeritus of Botany at Cornell, has long experience with wild and cultivated plants, has written about them often in a lucid and interesting style. This volume proves that he has not only not lost his touch, but has been able to recruit the assistance of Dr. Rice, another authority on horticulture as well as that of an accomplished wood engraver, Elfriede Abbe, to make it a thing of beauty and a joy forever. Gardners, herbists and botanists in general will enjoy the book. Those who delight in the exotic flavors the herbs can contribute to cookery, liquers, and the old-fashioned medication of "yard teas' will revel in what suggestions they may pick up on almost every page. In an age that is antibiotically daft it is good to know that botany, at least in some areas, is mending its fences, and pointing the way back to the old, empirically discovered, values in the edible parts of the green plants. It is perhaps too much to hope that Bot. Soc. would, in our generation, foster another section devoted to this resuscitating of the botany of Theophrastus, Galen, and Pliny. May thi s book point the way, when acquired allergies have been the undoing of synthetic medicine. Primitive man was not altogether a fool.

GENETICS, ADVANCES IN, ed. by M. Demerec; Academic Press, 125 East 23rd St., New York 10, N. Y. 1955. 309pp., 8 figs., 5 tabs. $7.50
47-30313

This 7th volume in Dr. Demerec's invaluable series contains six papers, by eight authors. They cover microbial drug resistance; the "obscura group" in Drosophila; chromosomal polymorphism in the diptera, abnormalities in the nuclear and cytoplasmic systems of frogs and toads; recent genetics of the rabbit; and, the origin and evolution of cultivated barley.

GENETICS AND HUMAN HEREDITY, by J. Ben and Helen D. Hill; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 526 pp., 202 figs., 53 tab. $6.50
55-6857

Thirty-five years of teaching experience have gone into this new book, designed for the liberal arts college course in genetics or use in the agricultural school. As a result, there is an exceptional clarity in the presentation of the facts,— internal evidence of the senior author's having tangled with the student mind. Despite the delightful fact that this general text on heredity with its human implications derives from the pens of a retired professor of botany and a member of the U.S.D.A. there seems to be no evidence of professional strabismus in assembling the facts or the examples used. The authors have drawn on the whole field with a catholicity that is commendable. Your Editor liked the introductory review of reproduction in plants and animals, the discussions of Mendel's first and second laws, chromosomal aberrations and the whole 58 pages devoted to human inheritance.

GENETIC HOMEOSTASIS, by I. Michael Lerner; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 1954. 134 pp., 20 tabs., 14 figs., 4 pl. $3.25

Homeostasis as defined by its conceiver, Dr. Walter B. Cannon, is the totality of steady states maintained in an organism through the coordination of its complex physical processes. After elaborating on this definition, our author proposes to review a series of superficially unconnected observations on the genetics of populations, to present a unifying hypothesis to account for them, and to demonstrate that it is possible to construct a genetic model on the basis of which the more complex integrative properties of Mendelian populations can emerge from evolutionary forces operating on individual phenotypes.

GENETICS, COUNSELING IN MEDICAL, by Sheldon C. Reed; W. B. Saunders Co., 218 W. Washington Sq., Philadelphia 5, Pa. 1955. 268 pp., 25 tabs. $4.00
55-9245

The Dight Institute for Human Genetics at the University of Minnesota is serving a very useful purpose in telling people what persons they ought to avoid in seeking a mate in marriage. The purpose of this book is to help the physician answer his patients' questions regarding heredity. It covers the most important problems that have had to be faced in the largest numbers at the Institute. Only traits that appear with a better than one in a thousand births are considered. It is a safe bet that any biologist who picks up this work will not soon lay it down. Anyone with a modicum of biological knowledge can understand it. So much of the advice offered to consultees is so practical and common sense that one wonders why this little volume should not be a second text in any course in genetics, human or otherwise. It would be a sure thing that the college book store would not be swamped by students wanting to sell **this** book back as soon as they had safely accumulated the credits offered for passing the course.

GENETICS AND METABOLISM, by R. T. Wagner and H. K. Mitchell; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 1955. 444 pp., 119 figs., 53 tabs., $7.50
55-8699

The associate professor of zoology at the University of Texas teamed up with the professor of biology at C.I.T. to produce this book with its more or less new, or at least, hitherto unaccented slant on genetics. It is a gathering together and organization of facts from genetics biochemistry, physiology, cytology and embryology, in support of the thesis that inheritance is the transmission of like forms of metabolism. In this unique approach it is something new and contributes aspects and angles which may prove interesting to research workers in any of the fields which it has drawn upon. The authors have not, however, gotten to the point where they can say just how hereditary factors control the patterns of metabolism. This is not a book for elementary students.

GENUS **CLARKIA**, by Harlan and Margaret E. Lewis; University of California Press, Berkeley and Los Angeles, Calif. 1955. 392 pp., 28 **figs.**, 3 tabs. $2.00

This monograph constitutes pages 241-392 of the current volume twenty of the University of Califronia Publications in Botany. The Clarkias are named for one of the leaders of the Lewis and Clark expedition, 1770-1838. A few of them have become domesticated, **Clarkia concinna** being known as "Red Ribbons" by reason of the slenderness of its four deep pink petals. They grow wild in the western areas of North America. The care with which this study was carried out, down to the chromosome number of the species. should make this a definitive criterion for all the species of the genus.

GEOLOGICAL SCIENCES, THE BIRTH AND DEVELOPMENT OF, by Frank D. Adams; Dover Publications, 1780 Broadway, New York 19, N. Y. 1954. 506 pp., 91 ills., paper $1.95

This is an unabridged republication of the first edition of December 1938. It should be in every biological library not merely because of the fossils found in historical geology, but because of the simple fact that the whole history of science was inextricably entangled from its very beginning until the comparatively recent age of specialization dawned. It is a surprising fact that so many of the early biologists were also mathematicians, geologists, and even astronomers, after a fashion. Of course, science was a lot simpler then.

GIFTED STUDENT AS FUTURE SCIENTIST, by Paul F. Brandwein; Harcourt Brace and Company, 383 Madison Ave., New York 17, N. Y. 1955. 107 pp., $2.00

A slim little atom bomb to disturb the complacency of the teaching profession, especially in the biological fields. The more or less constant moaning of the professional biologists that "everybody is going into atomic science" gets its come-uppance here. Brandwein is on the staff at Columbia Teachers College on leave to study precisely the problem he here presents. The program he presents has merits, but the ivory-tower boys who do the research work, and read the papers, and hold the offices in the scientific societies, will probably go on relying on the grace of God, and a long handled spoon, or some fortuitous concourse of atoms to produce their successors in the ivory towers of the future.

GOOD HEALTH FOR YOU, YOUR FAMILY and YOUR COMMUNITY, by Walke, Doscher and Caddy; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 415 pp., 46 ills., tabs. $4.75

54-12683

Three members of the staff of Brooklyn University collaborate to produce this new work which devotes its first part to the health of the family, its second community health, and its third to personal health. In its use of the newest statistics, it is up to the minute. In its enlarged scope, it leaves little of health, sanitation of hygiene unsaid. In its enormous range of information-sources, it is refreshingly cosmopolitan not to say universal. In its absolute opposition to narcotics and stimulants in any form, it will probably not be widely quoted by the purveyors and advertisers of wines, beers, liquors, cigars, or cigarettes, which are still, at least in theory, legally usable in some parts of the country.

GRAIN CROPS, by Harold K. Wilson; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 396 pp., 117 figs., 54 tabs. $6.50

54-11769

The professor of agronomy at Pennsylvania State College here presents the second edition of the textbook he first published in 1948. While its main use will be in agricultural schools, the book will be a good reference work for other library shelves, particularly in grain growing regions. After an opening group of chapters on grain cultivation in general, weed control, and insect pests, the author treats in succession, wheat and rye, oats, barley, flax, rice, buckwheat, millet, soybeans, corn, sweet corn, popcorn, sorghum. He closes with two good chapters on marketing grain, and improvement of crops. This revised version brings the book up to date particularly in matters of pest and weed control.

GRASSES, by C. E. Hubbard; Penguin Books, 3300 Clipper Mill Road, Baltimore 11, Md. 1954. 428 pp., 160 figs. $0.85 in paper.

Chalk up one more for the British team! Where many of our American taxonomists and field manual writers have shied away from the grasses, as too complicated for the anonymous John Does who like to botanize, the English Cousins have gone ahead and put out a compact little pocket-sized handbook that should have a wide appeal. Of course, it is devoted to British grasses. So many of them have been imported as far back as 1620, and vice versa, so many of our American types have found their way overseas, that the book will be of service even in this country. And to rub it in, if the British could be guilty of anything so unsportsmanlike, this book is printed on lightweight, cheap paper in a size that goes nicely into the pocket. Without stretching things a bit, this is the biggest eighty-five-cents-worth in the taxonomic field today. We intend to have our copy bound. The author has specialized in grasses since 1926. In 1930 he went out to Australia to revise the Queensland grass-collection at the Brisbane Botanical Museum. He came back to Kew with a collection of

70,000 floral specimens from the "Land Down Under."

GRASSES, HOW TO KNOW THE, by Richard W. Pohl; William C. Brown Co., 915 Main St., Dubuque, Iowa. 1954. 192 pp., 361 ills. Spiral bdg. 2.25, cloth $2.75

The Pictured-Key Nature Series which has become so popular under the aegis of H. E. Jaques, now is enriched by a key to the more common grasses, some 293 of them, which are frequently found in the U.S.A. Plant taxonomy has long been in need of a book like this. Too many of our wild-flower books have concentrated on the spring flora to the exclusion of any of the grasses. Even some of the year-around taxonomies have dismissed the grasses as being too complicated for any but a professional taxonomist to consider. Such a procedure has made the lower monocots a virtual **terra incognita.** It is good to see that Dr. Pohl has faced this issue squarely and effectively. All his illustrations are new, and made from actual specimens. Since the pestiferous spikelets which are such a hurdle to most collectors can easily degenerate in an artist's hands into generalized types, Dr. Pohl has taken his representations **via camera lucida** direct from original specimens. Each difficult type is keyed with a millimeter scale. With this there is hardly any need for anyone to go wrong on identification of the hardest ones. The 14 introductory and explanatory pages will be a great help.

GREAT EXPERIMENTS IN BIOLOGY, ed. by M. L. Gabriel and S. Fogel; Prentice-Hall, 70 Fifth Ave., New York 11, N. Y. 1955. 317 pp., $3.95
55-11373

This is a unique and much needed book. One wonders why no one thought of producing such an anthology before. We have had collections of famous biological papers before this, it is true, but none quite as effective as this one. It is divided into seven sections or parts. They are: the cell theory, general physiology, (subdivided into enzymes, hormones, vitamins, metabolism), microbiology, plant physiology (divided into auxins, photosynthesis), embryology (divided into the germ cell theory, and embryonic determination), genetics and evolution. Under each part or sub-part the material is introduced with a chronological list of dates and events pertinent to the field represented. These vary from two to five pages in length. Then in historical order appear selections, from three to nine in number, and all well-translated into English, from the greatest experimental contributions to modern biology. The oldest, Nicholas Cardinal Cusa's excerpt on the elements in biological substances dates back to 1514. The most recent is Th. Dobzhansky's 1947 excerpt on adaptive changes induced by natural selection in wild populations of drosophila.

GREEDY GARDNERS, by Richardson Wright; J. B. Lippincott Co., 227-231 So. 6th St., Philadelphia 5, Pa. 1955. 96 pp., 14 ills. $3.50
54-6113

In get-up this book could best be described by the popular adjective "plush." It comes in a shiny black slipcover, like an oversized prayerbook. It is illustrated by a few of the choicest black-and-white photographs of equally choice garden subjects we have ever seen. These words are not typed by way of criticism. The author, whose interesting personality romps out at the reader in every page, and nearly every line,— has a very practical theory to embody in his book. "Buy the best," he seems to say, "and your chances of disappointment will be proportionally less.' Since this book will probably be bought by those who can afford the best, there is no reason on earth why the book shouldn't match up to its subjects.

GROWING UNDER GLASS; GARDEN MAINTENANCE AND EQUIPMENT, ed by Mercer and Hay; Studio Crowell, 432 Fourth Ave., New York 16, N. Y. 1955. 141 pp., ill. $4.50

Volume 6 in the Gardens and Gardening series maintains the high character of its predecessors, even though its content material is not of the same botanical interest as its predecessors. Where they dealt with different kinds of shrubs, trees. plants, flowers, and landscape features, this volume has a more utilitarian purpose. It covers the greenhouse,— its construction,— heating,— flowers, fruits, vegetables, as well as reconditioning the garden, and modern developments in the line of gardening aids. So fine has this series of books been, it is to be hoped that it will not be terminated before we have at least one whole volume devoted to old and new house plants, what the Victorians used to call "stove plants." There are still a majority of gardeners who cannot boast of greenhouses for winter use, but who are disinclined to confine their gardening to the balmy days of the short northern summers.

—H—

HEALTHFUL LIVING, by Harold S. Diehl; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 529 pp., 53 figs. 25 tabs. $6.00
54-12674

This the fourth revised edition of a down-to-earth book on public health and family hygiene which first appeared in 1935. It has a series of seven 16-mm sound movies or 35-mm film strips which may be used with it, and which are to be obtained from the publishers. Considering the appalling number of young Americans who get little or no hygienic instruction in the grade or high schools, and still less in college, books like this are a desideratum, and give added point to the dedication of this one: "To those who prefer facts to fads, sanity to superstition, understanding to belief."

HEALTHIER LIVING, by J. J. Schifferes; John Wiley and Sons, 440 Fourth Ave., New York 16, N. Y. 1954. 928 pp., ills., $5.75

54-12593

This is a lot of book for the price being asked. Which is all to the good if the intentions of the author are thereby realized. His book is something new in biological literature, and therefore not exactly easy to place. Without degenerating into Coueyism, Dr. Schifferes holds that good health can be achieved by a life-attitude that is at once normal, well-adjusted and, therefore secure. Those who are interested in psychosomatic medicine might be inclined to jump to the conclusion that this is all that the book envisions. However, the author's acceptance of psychosomatic medicine as part of his general program indicates, it would seem, that he has a wider view which embraces more than any one part of the whole medico-psychic complex that is man. So he divides his book into four main parts after his introduction and orientation. These parts are:—Education for family living, mental health, personal health, and, as a corollary, community health. Only the skeleton of the book is indicated by these divisions. To see how well the author has clothed it with living flesh and sentient nerves through his mastery of language one has to read this refreshing book for one's self.

HEAVEN IN A WILDFLOWER, by M. B. Pond; Vintage Press, 120 West 31st St., New York 1, N. Y. 1954. 101 pp. $2.50

54-7513

Sentimental people who take their gardening as seriously as they do their religion,— and the woods and fields are full of them,—will be glad to know that they have a patron saint. His story has been recreated here by a minister's daughter, now a country doctor's wife, who has made of gardening something more than a mere hobby. She has gone abroad to widen her knowledge of the ancient and honorable craft of horticulture. Her reconstruction of St. Fiacre's life does not quite agree with that of Eleanour Sinclair Rohde in her "Story of the Garden" but it is close enough to satisfy the captious. Suffice it to say that the saint was a native of ancient Eire, and called Fiachra in his native tongue. Whether he left for France as the result of a love affair or not is almost too much in the accepted Hollywood pattern to be swallowed by everyone. That he settled near Meaux, lived, gardened and died there of old age seems at least to be quite probable. This fictionized biography may best be characterized by the Italian proverb: "Si non e vero, e ben trovato," (if it isn't true, at least it hits the mark).

HIROSHIMA DIARY, by Michihiko Hachiya; University of North Carolina Press, Chapel Hill, North Carolina. 1955. 238 pp. $3.50

Translated from the original Japanese by Warner Wells, this medical report is rapidly becoming famous. It begins with the experiences of a physician, director of one of the Hiroshima hospitals, from the moment the atom bomb exploded on 6 August. until the 30th of September. The account is factual, with very little of the personalities one might expect under the circumstances mixed into it. It is the sort of a diary which only a devoted physician might keep during a major epidemic. The book has received so many encomiums from people in high places in the U.S.A. that it must be read to appreciate how well deserved they are. This book belongs on every library shelf, without exception. For the medical profession it will have the most technical interest. For others it will give a vivid insght into what really happens when an A-bomb strikes.

HISTOLOGY, AIDS TO, by G. H. Bourne; The Williams & Wilkins Co., Baltimore 2, Md. 1954. 161 pp., 59 figs. $2.00

This is the sixth edition of a review manual which is one of a series for medical students. The author, Dr. Geoffrey H. Bourne, is reader in Histology in the University of London at the London Hospital Medical College.

HORMONES, HEALTH AND HAPPINESS, by W. H. Orr; Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1954. 322 pp., diags. $4.50

Although this book was written by a practising physician, it is not intended directly for the medical profession. In it the author has gathered together all the known information on the functioning of the ductless and other glands, and presented it so simply and non-technically that it cannot fail to attract anyone who has more than a perfunctory interest in the facts of life. Where there are no specialized courses in endocrinology offered, this book should prove a helpful adjunct to teachers and their classes in biology and human physiology.

HORMONES, NATURE AND ACTION OF THE HYPOPHYSEAL, GROWTH, by R. W. Smith, O. H. Gaebler and C. N. H. Long; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 576 pp., figs., tabs. diags. diags. $12.00

55-8643

When a symposium of 45 eminent scientists get to reading papers and vigorously defending or explaining them over a strenuous three-day period (27, 28, 29 Oct. 1954), it seems a shame that the publishers and/or the sponsoring body, could not find time, personnel, or money enough to index the report of the sessions. This is especially true when one considers that some of those who discussed the papers took the liberty to introduce new material. As a sort of college annual of what went on at the sessions this publications will serve admirably for the participants. For those not fortunate enough to attend, the scientific **hoi polloi,** in other words, a report like this becomes more or less of a temptation to take the name of the Lord in vain. If any of our readers are interested enough in hypophyseal hormones to want to buy the book, **caveat emptor!** Let the buyer beware! They shall have to read it from cover to cover to find if the subject they are interested in reached the point they desire.

HORMONE, THE FEMALE SEX, by Leon J. DeMerre; Vantage Press, Inc.. 120 West 31st St., New York 1, N. Y. 1954. 219 pp. $3.50

54-8353

From the pen of an experienced author who was educated in Belgium, came to the USA during WWII, and is now a technical adviser with the Army at Edgewood, this book presents the intriguing problem of sex hormones on a sort of middle-of-the-road basis, neither scientifically didactive, nor on the other hand, sensationally morbid. Apparently the road is not too level, for he sometimes veers off the center. When he credits Allen and Doisy both to Washington University Medical School in St. Louis, he is certainly off the center. Since 1923 Dr. Doisy has been connected with the St. Louis University School of Medicine. To emphasize the fact that he was at one time at Washington, and to suppress the fact that most of his research was done at the University of St. Louis is either ignorance or journalese, neither of which gives the average reader confidence in the author's competence.

HORSES AND THEIR ANCESTORS, by William A. Burns; 330 West 42nd St., New York 36, N. Y. 1954. 64 pp., ill. $2.75

54-8813

The Assistant Director of the American Museum of Natural History here presents the story of the horse with the aid of interesting illustrations by Paula Hutchison. Dr. Burns starts his story with the eohippus, brings it up to date, then discusses the uses of the horse, followed by famous horses of history, sport, literature and art. While this book would be enjoyed by any horse-lover, it is primarily intended for young folk,— but not too juvenile.

HORTICULTURE, LABORATORY EXERCISES IN GENERAL, by J. B. Edmond; Wm. C. Brown Co.. 915 Main St., Dubuque, Iowa. 1954. 92 pp., 33 tabs., 13 figs. $1.75

The senior author of the well-known "Fundamentals of Horticulture." by Edmond, Musser and Andrews, here presents the companion laboratory manual built around that text. Those of us who have been using the "Fundamentals" in our horticulture classes welcome this laboratory manual which will save us the trouble of shifting around over the field for a well-organized set of experiments to back up our classroom work. This set-up of each exercise, the outline of procedures, the space for drawings or notes, the review questions and the catholicity of the wide-ranging references, all cooperate to make a one semester's program which should be not only informatively practical but interesting as well.

HORTICULTURAL PLANTS, PROPAGATION OF, by Guy W. Adriance and Fred R. Brison; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 298 pp., 158 figs., $6.50

54-12243

Fifteen years ago the first edition of this practical work came upon the market. Since then a number of traditional practices have changed, new forms have been introduced, older ones and techniques have been dropped. It is time that this most popular of textbooks on the subject of plant propagation should see a thorough revision. Students of horticulture, no less than their instructors, as well as commercial propagators, and, of course, all that numerous gentry of the "green thumb" clan will welcome this new manual.

HUMAN ANATOMY, AN INTRODUCTION TO, by Clyde Marshall and E. L. Lazier; W. B. Saunders Co., West Washington Sq., Philadelphia 5, Pa. 1955. 420 pp., 329 ills., 15 in col. $4.50

55-5246

This is the fourth edition of Dr. Marshall's book which first appeared in 1935. Among improvements noted in the preface there are some that appear particularly happy. One is the inclusion of the organs of common sensation with all the rest of the nervous system. Another, and a distinctly new innovation, is the listing of the number of each figure at the top of the page on which it appears but towards the side of the page nearest the binding. Since both the page and the figure numbers are large and clear this will do away with the necessity of having to leaf through the book and scan each illustration to see its title and its number. All in all, the scope of this book and its modest size, and,— still more modest price, should make it worthy of consideration, either as a text or a reference. Dr. Marshall was formerly assistant professor of anatomy at Yale. The junior author is professor of Zoology at the University of California in Los Angeles.

HUMAN ORGANISM, by R. M. De Coursey; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 550 pp., 225 ills. $5.75

54-12691

Designed to give non-biology majors an understanding of human body processes without the more or less usual medico-nursing attitudes, this book keeps anatomy at a minimum, and presents for the first time an integrated human anatomy and physiology for liberal arts students,— at the college level. There are discussion questions at the end of each chapter, and all the usual visual aids available for such a course are in order. There is an 18-page glossary, and each chapter has suggested reading references.

—I—

INDIAN CORN IN OLD AMERICA, by Paul Weatherwax; Macmillan Co., 60 5th Ave., New York 11, N. Y. 1954. 253 pp., 75 figs., 2 col. pl. $7.50

Dr. Paul Weatherwax of Indiana University has placed botanists in general, as well as science historians and anthropologists, in his debt by this interesting work. In it he endeavors to solve the problems which have always risen about the origin, development and history of the use of **zea mays.** Since it is one of those vegetables deminitely not known in Europe before the days of Columbus, this is an intriguing problem. The author's handling of it, historically and botanically, is, as has been well said, fascinating. It is to be hoped that he will next take up the potato and run its past history to the ground.

INDUSTRIAL DUST. by Philip Drinker and Theodore Hach; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1954. 401 pp., 148 figs., 47 tabs., $10.00

54-6716

This second edition of Drinker and Hatch is by way of becoming a classic in preventive medicine. Although it is written from the engineer's standpoint, the impact on the work of the physician is obvious, since it is the medical man who will appraise the success of dust control. The authors are professors of industrial hygiene and of industrial health engineering at Harvard and Johns Hopkins respectively.

INSECT LIFE, FREAKS AND MARVELS OF, by Harold Bastin; A. A. Wyn, Inc., 23 West 47th St., New York 36, N. Y. 1954. 248 pp., 20 pl., $3.75

54-11364

Ever since Fabre began to humanize insects by telling their life stories in terms "understanded of the people," there have been frequent and, on the whole, successful attempts to emulate him. Harold Bastin. born in England in 1875, has been a lifelong entomologist in the Fabre tradition. He is also a model-maker for insects and plants. His book is one of those which lends credence to the old saying: "Truth is stranger than fiction," especially when it is scientific truth.

INSECTS, INTRODUCTION TO THE STUDY OF; by D. J. Borror and D. W. Delong; Reinhart & Company, 232 Madison Ave., New York 16, N. Y. 1954. 1030 pp., ills. $9.00

54-5398

As an introductory text in entomology, this book aims to cover at least adequately both the morphology and the taxonomy of each group without going into either more exhaustively than an introductory text would need. Each chapter ends with a modest list of references. There is a 28-page glossary. The 49-page index with three columns to the page, gives some idea of the number of types listed or discussed. Since there is no recent textbook which covers the fields that this one does, it is apparent that this volume will fill a long-felt need.

ION EXCHANGE AND ADSORPTION AGENTS IN MEDICINE, by Gustav J. Martin; Little Brown & Co., 34 Beacon St., Boston 6, Mass. 1955. 333 pp., 49 tabs., 24 figs. $7.50

55-5627

Subtitled "The Concept of Intestinal Bionomics," this book discusses the author's investigations of ion exchange resins for medical use. It is his contention, as yet unsubstantiated by clinical experiments, that all chronic degenerative disease has as an important component in its etiology, the absorption from the intestine of small quantities of toxic chemicals, which in the course of some time eventually create gross pathological conditions. As research Director of the National Drug Company of Philadelphia, the author has been working on resin therapy since 1944. He believes that ion exchange resins can be of palliative if not actually curative value in peptic ulcer, acid stomach, some types of diarrhea and high blood-pressure control, etc. Gastroenterologically interesting.

ION TRANSPORT ACROSS MEMBRANES, edited by Hans T. Clarke and David Nachmansohn; Academic Press, Inc., 125 E. 23rd St., New York 10, N. Y. 1954. 298 pp., text-figs. $7.50

54-10754

This report and MSS of the papers presented at the College of Physicians and Surgeons Symposium in Columbia University, October 1953, is dedicated to the memory of Jacques Loeb. There are fourteen papers in the book, and a note on the work of Jacques Loeb by Dr. W. J. V. Osterhout. It is fitting that the dedication was made to the scientist who pioneered in applying physical chemistry to biological problems. As Dr. Osterhout pointedly remarked, Loeb's studies of ion transport across cell membranes still is bearing fruit.

IRREVERSIBLE PROCESSES, INTRODUCTION TO THE THERMODYNAMICS OF, by I. Prigigine; Charles C. Thomas, 301-327 East Lawrence Ave., Springfield, Ill. 1955. 115 pp. $4.75

53-10958

In the preface to this treatise in higher mathematics the author explains that a serious limitation of classical thermodynamics as a general tool for the macroscopic description of physico-chemical processes lies in the fact that its method is based on such concepts as "reversible processes" and "true equilibrium states.' He further points out that it is now generally recognized that in many important fields of research a state of true thermodynamic equilibrium is attained only in exceptional conditions. Experiments wth radioactive tracers for example, have shown that the nucleic acids contained in living cells continuously exchange matter with their surroundings. Obviously, then, the majority of the phenomena studies in biology, meteorology, astrophysics and other subjects are irreversible processes which take place outside the equilibrium state. In this book the author presents a short and simple account of the recent developments in the thermodynamics of irreversible processes.

—L—

LABORATORY INSTRUMENTS, by A. Elliott, and J. H. Dickson; Chemical Publishing Co., 212 Fifth Ave., New York 10, N. Y. 1953. 414 pp. $7.50

This is a book for those who have to design their own research equipment, and use it themselves. As such, it is a shop manual for all sorts of unexpected processes, all the way from casting and jointing of metals to the grinding of glass lenses and the use of photography in research.

LANDSCAPING YOUR OWN HOME, by Alice L. Dustan; The Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1955. 248 pp., 24 pl., 21 figs. $3.95

The author has held several responsible positions in the periodical world since her graduation from Rutgers and graduate work at Columbia. This book is, perhaps, her big contribution to the green-thumbed world that cannot afford to call in the professional landscape artists, or who would just like to go ahead and do it themselves, even though they might, like the catty remark about the medics, have to bury their mistakes, preferably in the compost heap. At any rate it has been a long time since weve had a new book by an author who was willing to take us amateurs by the hand, and lead us on step by step to the enviable point a year or two later where we can say, with justifiable pride: "What do you think of it? I did it all by myself!"

LIFE SCIENCE, by T. S. Hall and F. Moog; John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 1955. 502 pp., ills. $6.50

55-5447

This textbook of general biology departs from the usual pattern by presenting science as an activity and tracing the history of scientific knowledge by showing experimental evidence as it was developed. Most of the great scientific studies are given in detail. There are discussions of the behavior of insects, birds and mammals, presented in perspective through surveys of work of students of animal behavior. Human inmplications are also introduced, though never to the extent of detracting from the essential purposes of biological study. There are about five hundred illustrations to supplement the text. There are two styles of type used. Large type covers the matter for a shorter course, smaller typed material expands it into a year course. A lab manual to accompany it is in preparation.

LIPIDS OF BIOCHEMICAL SIGNIFICANCE, THE CHEMISTRY OF, by J. A. Lovern; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 1955. 132 pp., 4 tabs., 2 figs. $1.75

A series of lectures to the Department of Biological Chemistry, at the University of Aberdeen in 1952 are here developed into another of those compact little, fact-filled, Methuen Monographs. Divided into five sections, it covers: the structure of the lipids, preparation and analysis of lipids, lipids in tissues, the dynamic state of lipids in the tissues, and the function of lipids.

LIVING FOSSILS, by Dr. Maurice Burton; The Vanguard Press, 424 Madison Ave., New York 17, N. Y. 1954. 282 pp., 83 ills. $5.00

The Deputy Keeper in the British Museum (Natural History) has given us another arresting book that should find its way to every college, and high school library. It graphically describes a large number of near-to-extinction animals, and some that have already become extinct. To these he adds a number of fairly common species which bear strong evidences of their being closely akin to prehistory. There are three priceless final chapters on the causes of extinction, possible causes underlying survival, and monsters and mystery animals. Nearly every page brings new and surprising facts, or theories to substantiate the facts we know. The first five illustrations, for example, give reconstructions of the general world geography in the Cambrian, the Lower Carboniferous, the Jurassic and the Eocene periods, and a diagram to illustrate the theory of continental drift. Among animal forms not too well known which are figured and described one notes the New Zealand tuatera, the Tasmanian thylacine, the South American yapok, the Australian koonunga, not to mention the Baanjakris, the lau, the chipekwe, or Queensland tiger.

LUMINESCENCE OF BIOLOGICAL SYSTEMS, ed. by Frank H. Johnson; American Association for the Advancement of Science, 1515 Massachusetts Ave., N. W., Washington 5, D. C. 1955. 466 pp., 161 ills. $7.00 (to AAAS members $6.00)

54-12547

From March 28th to April 2nd 1954 the National Academy of Sciences, the National Research Counciland the National Science Foundation sponsored and supported a Conference on Luminescence at Asilomar, Pacific Grove, California. The papers read are presented here under the editorship of Dr. Frank H. Johnson. In all there were 22 participants, presenting 17 papers. Dr. E. Newton Harvey, Princeton's **doyen** on luminescence lead off with the first paper, a survey of the luminous organisms. Since these papers are all more or less exploratory and open up new avenues beyond those discussed in Harvey's "Bioluminescence" this new book takes on an aspect of added importance. The fact that the discussion which followed many of the papers has been added to the text makes it all the more interesting and important.

—M—

MADAMI, by A. E. Putnam and A. Keller; Prentice-Hall, Inc., 70 Fifth Ave., New York 11, N. Y. 1954. 303 pp., 19 photos, 17 sketches. $3.95

54-9618

Some two thousand miles up the Congo River, not too far from the northeastern border of the Belgian Congo, on the banks of the Epulu River, the Belgian Government maintains a dispensary with an Agent Sanitaire in charge. He is the husband of the author of this book. In it Madami describes with a New York artist's eye, the impressions received in an eight year long stay among the Ituri pygmies. She is no mean artist with words, either, bringing the breath of life to routine native life, and rising to the thrill of a driver-ant invasion, native hunting dances, being bitten by a viper, being stalked by a leopard. This is a narrative by an anthropologist's wife which does credit to both the white and the pygmy races involved.

MAKING THE MOST OF MARRIAGE, by Paul H. Landis; Appleton-Century-Crofts, 35 West 32nd St., New York 1, N. Y. 1955. 542 pp., 59 figs., 17 tabs. $5.50

55-5623

This book, in the words of the author, is dedicated "to those who would make of marriage more than a "socially sanctioned sexual outlet," more than an "economic arrangement," more than the "expected thing to do." It is written in the complete faith that a knowledge of he facts, coupled with a will to succeed, can bring to most marriages a happiness and a success far above the level generally achieved." To provide these facts,— the experiences of many, the findings of science, the counsel of experts— represents its goal.

MAMMALIAN GERM CELLS, edited by G. E. W. Wolstenholme; Little Brown and Company, 34 Beacon St., Boston 6, Mass. 1953. 295 pp., 54 ills. $6.75

This book is the sixth in the series of reports of symposia or colloquia published by CIBA, an international center established as an educational and scientific **charity** under English laws. Its founder and chief support is Ciba Limited of Switzerland. On June 17-20th 1952 the symposium on "The Physiology of Mammalian Germ Cells" brought some forty zoologists together. The results of their labors as expressed in the uniformly short papers read, and the rather thorough discussions which followed, are all presented here in so wide a range of topics as to defy enumeration in this brief summary. Considerable reference is made to artificial inseminaton. There are bibliographies for the papers, and an index for the whole symposium.

MAMMALIAN PHYSIOLOGY, MANUAL FOR LABORATORY WORK IN; by Fred E. D'Amour and Frank R. Blood; University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill. 1954. 200 pp., ills., diags. $4.00

This manual was favorably reviewed in these pages when its first edition appeared in 1948. Since then the authors have eliminated the clumsy spiral binding, increased the number of experiments from 50 to 60, revised some of the older experiments, transposed the endocrine experiments ahead of the nervous system. The manual is still without page numbers, illustration and diagram numbers, and a table of contents. Perhaps they like it that way in Chicago. All in all, however, the explanations and the illustrations maintain the same high standard of excellence set by the first edition. It must be seen to be apnreciated.

MAMMALOLOGY, LABORATORY MANUAL OF, by E. L. Cockrum; Burgess Publishing Co., 426 South 6th St., Minneapolis 15, Minn. 1955. 160 pp., ills. $4.00

The author, Lendell Cockrum, of the University of Arizona, has given the study of mammals a much-needed shot in the arm. He has kept in mind the needs of both undergraduate as well as graduate students in wildlife management and mammalogy. As such, therefore, his book cuts across the historic provinces of several zoological fields, drawing ideas and applications as it unfolds its program. Since both elementary zoology and comparatve anatomy at the college level are prerequisites for the course for which it is designed, this manual may conveniently supply the practical application of what, to most students, is purely theoretical lecture or laboratory routine.

MAMMALS OF CALIFORNIA AND ITS COASTAL WATERS, by L. C. Ingles; Stanford University Press, Stanford, Calif. 1954. 396 pp., 100 figs., 46 pl. $6.00

54-7164

The number of plates and figures listed above do not begin to do justice to the plethora of unnumbered other items in this book. There are distribution maps, skull outlines, there are track patterns, and scats (fecal droppings) by the page-full. There are seven appendices,— how to collect and make up study-skins, dental formulae of the genera, a generic key of skulls, the aforementioned scats, pronunciation of some of the more difficult genera, a brief outline of the principles of classification, and a check list of native and introduced species. Following the introduction there are, moreover, chapters on the mammals of long ago, why we study mammals, and notes on **how** to study them. Originally entitled "Mammals of California" and published for the first time in 1947, this book has, after three reprintings, now come out in the revised form with the title given above. For one who hopes to biologize in California it should be a practical manual to have along.

MAMMALS OF THE HUACHUCA MOUNTAINS, by D. F. Hoffmeister and W. W. Goodpaster; University of Illinois Press, Urbana, Ill. 1954. 152 pp., 27 figs. Paper $3.30, bound $4.00

54-9663

This is the report of a field study which should be of interest to ecologists and mammalogists everywhere, and of particular significance to those who are concerned with the wild life of the adjacent areas, particularly in Arizona. Apparently the Huachuca Mountains have developed into a sanctuary for birds, mammals, grasses, ferns and other flora, and, as might be expected under the circumstances, insects. Since most of the other types had been classified, it remained for the Illinois group to see if the mammalian life was as diversified as the other kinds might lead one to suspect. It is. Seventy-eight kinds of recent mammals were catalogued in an area 1/500 of the state of Illinois, and this number is 40 per cent greater than those known from the whole sovereign prairie state.

MAN AND LAND IN PERU, by Thomas R. Ford; University of Florida Press, Gainesville, Fla. 1955. 176 pp. $4.00

55-9942

This sociological study of Peru is devoted mainly to a history of ownership, the evolution of man-land relations. current distributional patterns, land tenure systems, the Indian's part, reform measures, and the present changing scene. Since Peru is not one land, as the author says, but many, depending on its varied terrain and population, this study fills in an area of ignorance which affects us all. What we know about our South American neighbors is, for the most of us, next to nothing. In at least one respect we now have a stop-gap. However, it must be remembered this book contains more of history, sociology and economics, than of agriculture, agronomy or any other form of biology.

MAN IN THE THICK LEAD SUIT, by Daniel Lang; Oxford University Press, 114 Fifth Ave., New York 11, N. Y. 1954. 207 pp. $3.50

54-10001

Eric Sevareid, radio and television commentator, wrote a four-page introduction to this rather hard-to-classify book. In it he calls the author "a quietly superb reporter . . . a kind of modest Boswell to the special America that works and lives with the dividing atom. He shows us in detail how these Americans have adjusted their hopes and fears and daily habits at close range with the **Thing.** And so will the rest of us adjust as we come ourselves within range." Daniel Long is a writer on the staff of "The New Yorker." He has collected ten of his best articles and woven them into a ten-chapter story that is more than a story, comments that are more than commentating. Perhaps the best way to look at them is that they are the "picture of the place" on which to base a new kind of meditation, or even contemplation. Perhaps Sevareid sums it up best in the closing words of his introduction: " 'Human imagination has its limits.' This is our peril—and our safety. It is why, as Lang's report so clearly demonstrates, the strange society of the atom workers is no longer strange, the new era already old."

MAN'S NATURE AND NATURE'S MAN, by Lee R. Dice; University of Michigan Press, Ann Arbor, Mich. 1955. 329 pp. $5.00

55-10727

Since much of the material in this book is based on opinions of the author and his reference sources, but not on certified measurements and analyses of human communities, it is to be feared that this book will not rank with the author's very helpful other work, "Natural Communities." In fact, it is a bit difficult to place this new work. It isn't strictly sociology, and it isn't biology, and it isn't by any stretch of the imagination fiction. The author frankly admits that few attempts have been made so far to describe human communities from the point of view of their resources, physical habitat, human populations, associated plants and animals, and ecologic interrelations, including community regulatory mechanisms. There will be those who will adduce all sorts of arguments that Dr. Dice has not taken into his purview all the factors in human nature, that his is the more or less stereotyped anthropological idea of culture, and that he has left man's artistic and creative genius almost completely out of his thinking. It's pretty hard to fit a Beethoven "Fifth" or a Michaelangelo's "Moses" or an Einsteinian formula into the ambit of this book.

MARINE SHELLS OF WESTERN FLORIDA COAST, by Louis M. Perry and J. S. Schwengel; Paleontological Research Institution, 109 Dearborn Place, Ithaca, N. Y. 1955. 318 pp., 56 plates. $7.00

54-12005

First printed in 1940 in book form, this volume was reprinted in 1942. Under Jeanne Schwengel's deft hands it now comes forth completely revised, brought up to date, and bears an enthusiastic foreword by the Curator of Mollusks in Harvard's Museum of Comparative Zoology. As modern science pushes the boundaries of knowledge farther and farther into the unknown, certain fields are bound to become impossible to catalog completely in one volume, largely because of the mass of data discovered. This book wisely restricts itself to the west coast of the Floridean peninsula. While it thus eliminiates the shells of freshwater mollusks in adjacent streams and inland lakes, it has, at least, given us the latest word on the resources of that portion of the waters of the Gulf of Mexico. The number of plates is no indication of the number of excellent illustrations. Besides the spectacular frontispiece of **Spondylus americanus** there are 55 plates which figure from four to fifteen species, a total of 365 pictured. The plates are only part of the book. There are some 175 pages of systematic descriptions.

MEGACHILINE BEES OF CALIFORNIA, by P. D. Hurd and C. D. Michener; University of California Press, Berkeley, Calif. 1955. 248 pp., 112 maps, 24 plates. $3.50

Volume 3 of the Bulletin of the California Insect Survey is devoted to a race of important flower pollinators for special plant groups in the western areas of this country. An interesting feature of this work is its correlation of each species of the insect with the plants whose flowers it is known to pollinate. In the interests of wild flower preservation this opens up interesting ecological relations on a wholesale scale.

MICROBIAL PATHOGENICITY, MECHANISMS OF, ed. by J. W. Howie and A. J. O'Hea; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1955. 333 pp., figs., tabs. $5.00

Eighteen contributors present papers here which were to be discussed at a meeting of the Society for General Microbiology to be held at the Royal Institution in the middle of last April. The Symposium deals with a range of bacteria, protozoa and fungi pathogenic to man, animals and plants. Viruses were excluded because the last symposium was devoted to them exclusively. Among other very laudable purposes this symposium had in its purview was the proposal of "clear definitions whose adoption would greatly add to the precision and logic of future communications about pathogenicity, virulence, resistance and susceptibility. For a summary of our knowledge in the field up to the time of the symposium this book has few if any equals, and no betters.

MICROBIOLOGY, by F. C. Kelly and K. E. Hite; Appleton-Century-Crofts, Inc., 35 West 32nd St., New York 1, N. Y. 1955. 615 pp., 185 figs., 22 tabs. $5.50

55-8365

This is the second edition of a work which first appeared in 1949, and has made such a favorable impression that a new edition was called for. The senior author is professor of bacteriology at the U. of Oklahoma School of Medicine, while the junior author is a practising physician in the Montefiore Hospital who was formerly assistant professor of bacteriology at the University of Chicago. The first 300 pages are really the biology of bacteria considered as living entities. The last 200 deal with the pathogenics in the list. There is a three-chapter section on public health. There are 24 pages devoted to media, indicators and stains.

MICROBIOLOGY, GENERAL, by W. G. Walter and R. H. McBee; D. Van Nostrand Co., 250 Fourth Ave., New York 3, N. Y. 1955. 345 pp., ills. $4.75

55-6882

This is the old Swingle book, revised and brought up-to-date by his successors at Montana State College. It still remains one of the most practical introductions to bacteriology in the book market today. It has been expanded somewhat in its scope, in order to include more of the economically important organisms which could not properly be classed as bacteria. For any one who is looking for a bacteriology or microbiology textbook that is nt being wagged by the medical tail, this shuld be worth considering.

MICROBIOLOGY, PERSPECTIVES AND HORIZONS IN, ed. Selman A. Waksman; Rutgers University Press, New Brunswick, N. J. 1955. 220 pp., 4 figs. $3.50

55-6104

This is the report of the dedicatory symposium on the occasion of the opening of the Rutgers Institute of Microbiology. There were 16 who contributed to the main events of the symposium, which had three parts, —the first on the microbe as a living system, the second on the metabolism of microorganisms, the third on microorganisms and higher forms of life. To these has been added the addresses, three in number, delivered at the actual dedication ceremony, forming, as it were, appropriate frosting, on an intellectually nourishing microbiological layer cake.

MICROBES AND YOU, by S. E. Wedberg; Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1954. 439 pp., 75 figs., 11 tabs., 3 col. pl. $4.50

The associate professor in the department of bacteriology at the University of Connecticut, here presents a compact manual for those who, without much scientific background, have to, or wish to, take a survey course as part of their general education. Not intended for preprofessional students, its chief advantages ar in eits adaptability in a cultural course to convey some very necessary and wholesome ideas about the influences, not only of bacteria, but also of the molds, yeasts, rickettsias and viruses, in human life and the effects they have had on the course of civilization.

MICRO-ORGANISMS, THE CHEMISOF. by Arthur Bracken; Pitman Publishing Corp., 2 West 45th St., New York 19, N. Y. 1955. 343 pp., $6.00

This book takes a somewhat different slant at micro-organisms. Confining itself entirely to the bacteria and moulds, and with an objective of showing how they are "caught," "trained," and put to work, the whole work is devoted to the chemical changes thus brought about. It is not intended for the uninitiated in chemistry or bacteriology. There is an interesting chapter, however, on experimentation with soil cultures and the isolation and cultivation of strains of organisms thus discovered. With the exception of this practical application, the entire work deals with theory . There is a concluding chapter on the effect of external changes on the nature and behavior of micro-organisms.

MIDWEST FARM HANDBOOK, by Iowa State College Staff; Iowa State College Press, Press Building, Ames, Iowa. 1954. 381 pp., ills., tabs., maps, etc. $3.00

54-11724

There is a lot more than three dollars worth of common sense in this all around family adviser. About the only things it lacks are cooking recipes and medicinal advice. Here are a few of the 18 chapter headings: Livestock, livestock disease prevention, poultry and their diseases, agricultural engineering, weed control, seed treatment, pest control, business end of farming, farmstead planning and development, horticulture. There are also chapters on all useful measurements needed in farming, and on weather. Although the book is well edited, there are no seedcatalog typess of illustrations. Nor are there any smart-aleck sophisticated suggestions. The book is as down to earth as the people for whom it is intended. Never anything more than just what it pretends to be, this book lives up to all its pretensions.

MIND AND THE EYE , by Agnes Arber; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1954. 146 pp. $3.00

"In the course of a period, extending over half a century, in which my concern has been with research in plant morphology, I have found my mind dwelling more and more upon the nature of scientific thought, and its relation to other intellectual activities. Such ponderings have led me gradually to realize how little I, as a biologist, could actually justify, or even, indeed, understand, the nature of the basic assumptions and modes of argument which, in accordance with scientific tradition, I was simply taking as 'given'. . . . The present book offers a more generalized analysis of the biologist's approach to his own subject and to philosophy." Thus says the author in her preface. She uses examples from botany to illustrate her points, but her whole argument is isformed by an exceptionally wide knowledge of the philosophers who have written on the same questions. Her knowledge of her sources, not only in biology, but in philosophy, and more especially in literature, i.e. the poets, is amazing.

MOSQUITOES, by William R. Horsfall; The Ronald Press Co., 15 East 26th St., New York 10, N. Y. 723 pp., 206 tabs., $16.00

55-6089

Although he had been at work on this volume some half-dozen years before Pearl Harbor, Dr. Horsfall had ample opportunity to see the devastating results of mosquitoes at work first hand. So this volume takes on the aspects of a labor of love, rather than a professional bid for scientific kudos. For once and all he has combed the world for information about mosquitoes, all of them, and gathered it here in one great monolithic monograph, giving all the medically important ones, and many others, their synonymy and geographical distribution, with separate consideration of the local distribution, incubation and drought-resistance of the eggs, and of the larvae.

Under the latter is included whatever records there are of the duration of larval stages. Adults, at least as far as **Anopheles** is concerned, are considered under the headings: local distribution, dispersal, feeding, ovulation, oviposition, reservoir for plasmodium, reservoir for filarids. Under **Culex** the adult story includes, in addition:— swarming, mating, development, longevity, digestion, storage, excretion, secretion, vision, resistance to heat, and resistance to DDT. As of 11 February 1955 this is the last word on the bionomics of mosquitoes. It is a poor zoological or medical library that does not have a copy.

The author of **"Mosquitoes"** in a huddle with the editor of the **"Biologist"** in front of the 17th Malaria Survey Unit Hq., Ahoima, Milne Bay, Papua. in the Fall of 1943. Capt. Horsfall was C.O. of the 17th M.S.U.

MOSSES, by E. T. Bodenberg; Burgess Publishing Co., 426 S. Sixth St., Minneapolis 15, Minn. 1954. 264 pp., 49 pl., tabs. $5.00

The sub-title to this work is: "A New Approach to the Identification of Common Species." The author set out to make it possible for a larger number of nature lovers to further complete their study of natural objects by becoming better acquainted with the common mosses of the United States. This meant selecting the most representative types in the whole country, some 156 in all. They are grouped taxonomically, as well as by types of habitat.

MOSSES, FERNS AND MUSHROOMS, THE STORY OF, by D. Sterling; Doubleday & Co., 14 West 49th St., Rockefeller Center, New York 20, N. Y. 1955. 159 pp., ills. $2.75

55-7012

There is a lot of cryptogamic botany crammed into the pages of this thin book. It is profusely illustrated with unusually good photographs. For young people who like to live part of their time in the woods, this should be an excellent item of indoctrination towards a sustained and continuing interest in the things of the out-of-doors.

MOTHS, by E. B. Ford; Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1955. 266 pp., 148 ills., 77 in color, 19 maps and diags. $7.50

Entomologists and, to some extent, geneticists, should find this offering in the "New Naturalist Series" of particular interest. The rest of us mere biologists will enjoy it too, even if the locale and the forms studied are all British. The author is attached to the Genetic Laboratories of the Zoology Department in Oxford. He is also a Fellow of the Royal Society. As might be suspected, his approach is genetical, but this leads him on to distributional and dispersal problems. His own studies on populations are the closing theme of the work. Particularly interesting are the color plates of identical species from different parts of Britain, especially so are the comparisons between those from rural and industrial and therefore sooty areas. In this last respect the selective advantage of melanism is attracting considerable attention.

MUMPS, MEASLES AND MOSAICS, by K. M. Smith and R. Markham; Frederick A. Praeger, 105 West 40th St., New York 18, N. Y. 1954. 160 pp., 25 pl., 10 figs. $4.00

54-9295

This is a book on plant and animal viruses, the senior author of which is an honorary fellow of Downing College, Cambridge, England. Appearing as this book does in the Naturalist Series it should receive a considerable amount of attention outside the professional groups more or less attached to the various phases of virology. Popularly written, but not written **down** to an unintelligent level, it should help to interest more people in the extent and destructiveness of some of the more common virus diseases. It is well illustrated, four of the twenty-five plates are in color. There is a complete glossary, also a table for the recognition of common plant mosaic infections.

MYCOLOGY, INTRODUCTION TO INDUSTRIAL, by George Smith; St. Martin's Press, 103 Park Ave., New York 17, N. Y. 1954. 378 pp., 161 ills. $6.00

Now in its fourth edition, this volume bears an introductory foreword from the pen of H. Raistrick, also on the staff of the world-famous London School of Hygiene and Tropical Medicine. The latter comments on microorganisms as eliminators of dead organic matter, as threats to commercial manufactured materials, as beneficent in the production of cheeses and antibiotics. He winds up his statements by citing the need for a manual which will be understandable and useful to those who are concerned with any of these activities, especially with the fungi, but who have not previously had an adequate botanical training. This gives a clue to the book under discussion. It is designed for those interested in the moulds rather than the fungi in general. Subjects treated are the moulds from the zygomycetes to penicillium. The latter 150 pages are a manual of directions for culturing and using the organisms.

MEDICAL MYCOLOGY, by R. D. G. Ph. Simons; Elsevier Press, 402 Lovett Blvd., Houston, Texas. 1954. 446 pp., 257 figs. $9.75

54-8489

From "The Handbook of Tropical Dermatology and Medical Mycology" previously and favorably described in these pages, Dr. Simons has selected the medical mycological parts for separate publication. The only change,— and a desirable one,— has been the first chapter on the development of medical mycology by C. W. Emmons of Bethesda, Maryland. There are 41 chapters in the book, most of them by different authors, and the latter hail from every part of the disease ridden world, including Brazil, Spain, Egypt, Mexico, France, New Zealand, Kenya, Israel and Netherlands as well as the U.S.A. It occurs to us that this book should be in the kit of any medical officer accompanying our armed forces into tropical areas. Which prompts us to a nugatory search for our old friend (?) of Southwest Pacific days, "Jungle Rot."

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NATURE, INTRODUCTION TO, by John Kiernan; Hanover House, 575 Madison Ave., New York 22, N. Y. 1955. 224 pp., 300 pl. in col. $6.00

55-9501

The irrepressible Mr. Kieran of radio, television, sports-column fame, here combines three of his best publications in one biological omnibus which any member of our profession might be glad to have lying about his home, particularly where there are inquisitive or curious children. Part I is devoted to birds, with illustrations by Don Eckelberry. Part II is the wild flower section illustrated by Tabea Hofmann. The third part on trees has its color work from the brush of Michael H. Bevans. Those who have seen the separate issues as they appeared on the market will welcome this composite volume as an old friend. Those who are not acquainted with the John Kieran of the roadside and fields are missing a rewarding experience. About the only criticism of the work we could venture to offer is the fact that too many of the popular local names have been omitted, the Buzzard, the Michaelmas Daisy, and the Cowslip, for example. The alphabetical index is in the front of the book, an innovation whose merit remains to be seen.

NITROGEN METABOLISM OF MICROORGANISMS, by B. A. Fry; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 1955. 166 pp., 3 pl., 14 diagr. tables $2.00

The lecturer in microbiology in the University of Sheffield here presents the material used in a series of lectures to post-graduate students in a one year course in microbiology at the university. The main emphasis, under such conditions, has been placed on bacteria and fungi. Each chapter has a number of references appended.

NUTRITION AND METABOLISM, STANDARD VALUES IN, ed. by Errett C. Albritton; W. B. Saunders Co., West Washington Sq., Philadelphia 5, Pa. 1954. 380 pp., 160 tables, $6.50

54-12407

Eight hundred specialists in human, animal and plant nutrition combined in the production of this authoritative work, which is the second of the Wright Air Development Center, U.S. A.F., productions for the National Academy of Sciences-National Research Council of compilations of the more basic established data in the various fields of biological sciences. The amount of checking and counterchecking in every phase that went into this work was tremendous. The more one studies the more one sees uses for the data compiled here, ranging as it does through all the kinds of possible nutrients, and then through the kinds of organisms that might use them.

NUT TREES OF NORTH AMERICA, by Clarence A. Reed and John Davidson; Devin-Adair Co., 23 & 25 East 26th St., New York 10, N. Y. 1954. 404 pp., 22 pl., 14 figs. $6.00

54-9299

This well-written book gets more interesting the farther one gets into it. The ultimate conclusion is that city planners and landscape artists are missing the boat on their choice of home, street and park trees. The treatise is divided into nine parts, the first four of which deal with the **Juglans** group, the hickory group, the chestnut group, and the four natives (beeches, oaks, filberts, buckeyes). Part five deals with some exotics for special climates, the pistachio, cashew, macadamia, almond, tung, pinon and ginkgo. Parts six, seven, eight and nine are devoted to cultural, pathological, directives, as well as a final discussion on their food and chemical values. This is a book every botanical library should possess.

NUTRITION SOURCEBOOK, by Oliver E. Byrd; Stanford University Press, Stanford, Cal. 1955. 370 pp., $7.50
55-6951

In spite of the accent on nutrition, not only in American medicine and education, but also in international relations, this book, strange to say, is the first of its kind. There are twenty chapters subdivided into numbered sections, which, all told, rup up to some 396. The author hails from California, but the casual reader would not awake to the fact. The suppression of informative data on the use of fruit, salads, nut meats, and the chlorophyllaceous leaves, may have been accidental. It certainly puts the author out and beyond the reach of a suspicion of collusion with one of the state's best known industries,—Hollywood excepted, of course. Otherwise, the book is a good first effort. After the teachers and students who use it have had a chance to work it over there will no doubt be changes.

NATURAL PHILOSOPHY OF PLANT FORM, by Agnes Arber; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1059. 247 pp., 46 figs. $5.00

Perhaps the best summary of this book's contents and purpose is contained in the distinguished author's preface:— "I have tried to express certain general ideas, which have gradually disengaged themselves in my mind, in the course of a lifetime's concern with the morphology of flowering plants, both as it is understood today, and in its historical development from the time of Aristotle onwards. I began by thinking of this subject quite simply as a branch of natural science, but I have come finally to feel that it reaches its fullest reality in the region of natural philosophy, where it converges on metaphysics, to which it brings its own, distinctively visual, contribution." So, the author, who is an authority on early botanical writings discusses chapter by chapter the plant morphology of the Aristotelian School, of Albertus Magnus and Cesalpinus, then from Jung to Goethe and de Candolle, and then goes on through the various theories under which the plant parts have been studied through the ages. Her concluding chapter on the Interpretation of Plant Morphology must be read to be appreciated.

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OCEAN FLOOR, by Hans Pettersson; Yale University Press, New Haven, Conn. 1954. 181 pp., 48 ills., figs. $3.00
54-9521

This book is the thirty-third volume published by Yale University in keeping with the provisions of the Silliman Foundation. The 1952 lecture was given by the noted Swedish oceanographer who has summed up here all that is known to date about the bottom of the great seas, particularly the Atlantic Ocean. Some surprising facts are corroborated. As an example, the lists of living organisms dredged up from depths of 10,500 meters in the Philippine Trench are a bit surprising. Some of the difficulties to be contended with, not so much change of pressure, as temperature rises between the icy cold of the deeps and the warm surface layers, are discussed in detail. Those who are interested in oceanography, or just merely aquatic life under unusual conditions will find this little work very worthwhile.

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101 ALPHABETS, by W. Ben Hunt and Ed. C. Hunt; Bruce Publishing Co., Milwaukee 1, Wis. 1954. $3.75
54-7739

Two commercial artists who are noted for their ability in the art of lettering have here combined their previous works and issued a complete series of more than a hundred different styles of alphabets, most of them with both capitals and small letters. From Trajan's Column of 100 B.C. down through the missal texts of the middle ages, and up through the vagaries of mid-Victorian type manufacturers to the austere lines of modern mechanical drawings, practically every style of lettering known to western civilization is represented.

ORGANIC GARDENING, by J. I. Rodale; Hanover House, 575 Madison Ave., New York 22, N. Y. 1955. 224 pp. $3.95
55-8409

The author of this work has been for many years the editor of "Organic Gardening and Farming." He has six books to his credit. He conducts his own 60-acre experimental farm in Emmaus, Pa. He is an energetic advocate of the use of organic matter, humus, composting and mulching, as means of preserving and building up soil. He is an equally strenuous opponent of all strong chemical fertilizers, and poison sprays. By the criteria he enuntiates for healthy soil, we who have been using sewage disposal plant wastes, should expect to find it not only discussed but strenuously advocated. The book is ominously silent on the entire subject. Yet we who are in a reasonable shipping range of the Milwaukee City Sewage Disposal Plant, have for years been using its product "Milorganite" with great success. Our heavy clay soils are becoming crumbly and friable. Earthworms have increased in number almost to the nuisance stage, and were it not for the increasing hordes of robins which dog each gardener's footsteps and gluttonize each time we water our lawns and flower beds, we would probably have to go into the night-crawler business to keep the worm population within reasonable bounds. But of these possibilities there is no word in this otherwise interesting book.

ORNITHOLOGY, AN INTRODUCTION TO, by George J. Wallace; Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1955. 443 pp., 180 ills., 6 tabs. $6.00

Prepared to be exactly what its title implies, this book will serve as something more than a classroom text. It is arranged on the basis of a chapter a week for a 12-week semester, or a 16-week semester with four optional chapters. It is well illustrated, and bibliographies are supplied not only for each chapter but an extensive 314-title one for the whole work. Part One of the book covers the general anatomy and physiology of birds. Part Two discusses classification, fossil birds, ornithological methods, and organizations and their journals.

OUR NATURAL RESOURCES, ed. by Juanita M. Kreps; The H. W. Wilson Co., 950-972 University Ave., New York 52, N. Y. 1955. 189 pp. $2.00

55-6801

This is Vol. 27, No. 2, in the Reference Shelf Series. It is divided into five main sections, ownership and control, hydroelectrc power, tidelands, public lands, and atomic energy. Each section contains from six to eight extracts from important official, professional, or periodical articles on the matter in hand. As a handy source of spot information, or at least, as a lead to further study of sources, on matters more or less controversial in character, these Reference Shelf Series books have a lot to offer. Prominent people whose statements are quoted in this volume include W. H. Stead, D. McKay, Dwight Eisenhower, Estes Kefauver, Joe Miller, H. M. Fleming, Alan Barth, Lester Hunt, Laurence F. Lee, James R. Newman, and William Hard.

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PAPER CHROMATOGRAPHY, by Dr. Friedrich Cramer; St. Martin's Press, 103 Park Ave., New York 17, N. Y. 1954. 124 pp., 68 figs., 4 col. pl., 2 transparencies and 1 folding plate. $5.00

Originating in Heidelberg, this valuable instruction and theoretical manual has been rendered into English by Leighton Richards. Where minute quantities of substances are all that is available for testing purposes, it would appear that paper chromatography is the answer.

PARASITISM, SOME PHYSIOLOGICAL ASPECTS AND CONSEQUENCES OF, ed. by William H. Cole; Rutgers University Press, New Brunswick, N. J. 1955. 90 pp., figs., tabs., etc. $2.00

53-753

The Rutgers University Annual Conferences on Protein Metabolism for 1955 are here reported with contributions on the cultivation of Malaria Parasites by William Trager; on Protein Metabolism of Intracellular Parasites by James W. Moulder; on Intestinal Physiology and the Host-Parasite Relationship by Clark P. Read; on Studies of the Glycolytic Enzymes of **Schistosoma mansoni** by Ernest Bueding; on Studies in Antibody Formation by William H. Taliaferro, and on Leishmaniasis in the Hamster by Leslie A. Stauber.

PARASITOLOGY, INTRODUCTION TO, by Asa C. Chandler; John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 1955. 799 pp., 257 figs. $8.50

55-9362

This is the 9th edition of Chandler's classic work which first appeared in 1918. It is perhaps significant of something unfortunate that parasitology is lapsing back into its prewar inadequacy. Apparently the armed forces are not the only ones to be partially demobilized in the piping days of peace. Our national penchant for declaring armistices on a moment's provocation seem to be short sighted policy, especially when the enemy, even only parasitic, is still within our borders. Dr. Chandler's book should at the very least be an armory of defense should the need for it unfortunately arise in the form of pestilence or plague.

PASSENGER PIGEON, by A. W. Schorger; University of Wisconsin Press, 811 State St., Madison, Wis. 1955. 424 pp., 22 figs., 5 tabs. $7.50

54-6738

One hundred and three pages of references attest to the scientific as well as historical accuracy of this book, the greatest threnody ever assembled for a bird that has passed out of the living picture. So many have mourned the extinction of one of our most prolific and graceful birds that it seemed hardly possible that anyone would care to monograph it. Professor Schorger of the University of Wisconsin's Department of Wildlife Conservation, however, elected to do so. He made it a labor of love and has achieved thereby a book of distinction. It should be in every public and private school, in every university and college library in every English-speaking country throughout the world. The British, too, and the other nations of their Empire, have felt the pang of too-late regrets at the loss of some of their wild life. It is to the honor of the University of Wisconsin that this first commemorative volume on a vanished species should emanate from its campus.

PEARL KING, by Robert Eunson; Greenberg, Publisher, 201 East 57th St., New York 22, N. Y. 1955. 243 pp., 32 ills. $3.95

55-10964

Because of its title, this book intrigued the Editor of "The Biologist."

The pearl is most interesting of all the jewels since it is the only one that is of biological origin. It turns out that this is the life story,—very well told,—of Kokichi Mikimoto, the fabulous "pearl king" who discovered a way to produce cultured pearls with a core of Mississippi River clam nacre! This granule is inserted in captive three-year-old oysters and is later harvested when the pearl formed around it has reached the desired size. In a certain sense, Mikimoto's cultured pearls were more pure than the fabulous other pearls of history. They, as has more than once been noted, have a chunk of irritating dirt at their core which the oyster tries to render less bothersome by coating it with the pearly substance. That Mikimoto was a friend of the U.S.A. and posed as a pacifist in Japan after Pearl Harbor,— and got away with it, makes this life-story all the more interesting.

PEOPLE, THE PREVALENCE OF, by Marston Bates; Charles Scribner's Sons, 597 Fifth Ave., New York 17, N. Y. 1955. 283 pp. $3.95

55-7190

The careful reader will have no difficulty in seeing that this book is an attempt by a very literate scientist to answer his own question: "By forestalling death through disease, might not public health projects be creating a new problem as they solved an old one? Might they not be providing more human material for death by starvation in the overcrowded countries of the world, by simply changing the disease problems into a population problem?"

PERENNIALS, by Marjorie P. Johnson; Rinehart and Co., Inc., 232 Madison Ave., New York 16, N. Y. 96 pp., 33 figs. $1.50

55-5084

The author of this work is the managing editor of "Flower Grower," and it has been austerely illustrated with outline sketches by Revecca and Douglas Merrilees. The end papers would make a beautiful pattern for the border of a dinner plate. This is one of those "how to" books, and there is no one more competent to tell one "how to" raise perennials than the author-editress. The first part is general horse sense without any of the sticky green-thumbiness one expects when the gentler sex begin to poke their ball-point into their "Tony." The second part is devoted to only fourteen old favorite types which have kinds that will grow almost everywhere in the USA except perhaps the Arizona deserts or a Connecticut salt marsh. Taking the hollyhock as an example it is treated under: common name, botanical name, height of plants, planting distance, flowers, foliage value, best growing regions, propagation, planting and transplanting, culture, pests, how to use, blooming companions, and good varieties.

PHOTOSYNTHESIS, by Robert Hill; C. P. Whittingham; John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 1955. 165 pp., tabs. and figs. $2.00

This is another of those fact-packed Methuen monographs which our British confreres do so well. The senior author is a biochemist, the junior is a botanist, both at Cambridge University. Their concluding paragraph runs as follows: "There are at present good indications of the mechanism of photosynthesis on the basis of actual carbon compounds concerned. This is the method of most general interest for biochemists. The methods of Calvin, when they can be combined with the **in vitro** enzyme studies, can advance our knowledge rapidly."

PHYSICS, BIOLOGICAL AND MEDICAL, by R. W. Stacy, D. T. Williams, R. E. Worden and R. O. Morris; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 586 pp., figs., tabs. $8.50

55-6868

Although designed for student use, this book winds up with a trifurcated service. It serves as a fundamental for the biology student. For the physics student it opens up potential fields of study and research (without proselytizing!). It will help the medical student understand some of the problems which will confront him as he prosecutes his course. In a word, the book defines the relation between physics and the physiological sciences. This eventually shows that there exists a set of principles, not merely a plethora of problems, that makes up this part of biophysics. Since this set of guiding and formative principles have not as yet been as forthrightly stated, this book puts itself in a class by itself. Like the Triborough Bridge, this book connects many different scientific disciplines.

PHYSIOLOGY, COLLEGE, by D. M. Pace and B. W. McCashland; Thomas Y. Crowell Co., 432 Fourth Ave., New York 16, N. Y. 1955. 615 pp., 315 figs., 19 tabs. $5.50

55-7305

From the Department of Physiology at the University of Nebraska comes this new textbook for college courses in human physiology, especially those whose knowledge of biological science is not over-generous. Thus it will find patronage in classes where students in pharmacy, dentistry, physical education, nursing and teaching are trying to meet the science requirements for their degrees. Because of this the authors have been careful to define their new terms as they go forward,— the glossary is refreshing on this score, too,— and the illustrations are mostly new, and diagrammatically clear. All in all, for one who is looking for a text, or a reference work, which is aimed at the student, and not the professional, mind.

PHYSIOLOGY, HUMAN, by Houssay, Lewis, Orias, Braun-Menendez, Hug, Foglia and Leloir; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 1177 pp., 504 figs., 120 tabs. $12.00

The first edition of this book was very favorably commented on in these columns when it first appeared in 1951. That a second edition in English should be called for in four years speaks for itself. Some changes have been made in the original version. We note that Blood Groups have been added to the chapter on Hemorrhage and Transfusion. The title of the twentieth chapter has been changed to Vasomotor Activity. Chapter 35 is now devoted to the general physiology of digestion, and the next has been expanded to include not only salivation but mastication and deglutition. A new chapter is entitled "The Large Intestine," probably in the interest of colitics. A synonymous treatment has been given to the 66th Chapter which now discusses excitability, and electrical phenomena in tissues. The chapter on adrenalin has been modified to include the secretion of the adrenal medulla.

PHYSIOLOGY, TEXTBOOK OF, by John F. Fulton, editor; W. B. Saunders Co., Philadelphia, Pa. 1955. 1275 pp., 600 ills. $13.50

55-5200

Fifty years ago W. H. Howell produced a volume that was to be for physiology of the human what Gray's "Anatomy" had come to be. During the ensuing half-century it, like the "Anatomy" has grown far beyond the capacities of one author to produce. Collaborating with Dr. Fulton in this monolithic manual are D. H. Barron, W. D. Blake, J. R. Brobeck, G. R. Cowgill, P. H. Fenton, T. R. Forbes, S. Gelfan, D. I. Hitchcock, H. E. Hoff, D. P. C. Lloyd, T. C. Ruch, and J. A. Russell. Completely rewritten are the first seven chapters, the section on body fluids and kidney function, as well as on respiration. A new chapter has been added on acetylcholine and energy transformations in nerve cells.

PHYSIOLOGY, TEXTBOOK OF GENERAL, by Hugh Davson; Blakiston Div., McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1942. 659 pp., 288 figs., 41 tabs. $7.00

The columns of "The Biologist" are late in securing a copy of this valuable manual for announcement in these pages. The first edition appeared in 1951 and it had to be reprinted the following year. In Claude Bernard's sense of the words, it has approached physiology from the general viewpoint, i.e. from that group of phenomena that are common to both animals and plants. The general physiologists, we are told, because of their thorough training in mathematics, physics or chemistry, seek to provide explanations in terms of concepts already familiar. The author has, therefore, attempted to gather together the results of such research as may explain living phenomena in terms common to the basic sciences of physics and chemistry. As such, the scope of the book is frankly admitted by the author to be somewhat restricted. To keep it within reasonable bounds, it had to be cut down and many subjects the author envisioned or had already in script had to be entirely eliminated. Whether used as a classroom text, or not, the manual is one worthy of a place on the physiological library shelf, if only to prove that "variis modis bene fit," in other words, there is more than one way of skinning the physiological cat.

PILTDOWN FORGERY, by J. S. Weiner; Oxford University Press, 114 Fifth Ave., New York 11, N. Y. 1955. 214 pp., 9 ills. $3.50

One of the scientific workers who participated in the exposure of the Piltdown fake, is the author of this book. He is Reader in Physical Anthropology at Oxford. Step by step he traces the origin of the Piltdown "finds." Next he discusses the impact of the discovery. Finally he goes into detail about the dissenting group who refused to be taken in by the reported manifestation, and traces back all their suspicions as to its reality and reliability. When the Vatican Archives, Library and Museum were thrown wide open to all properly qualified students and scientists the reigning Pontiff is reported to have told those who were afraid of what might be discovered there: "Never fear to state the truth." Since one of the most enthusiastic propagators of **Eoanthropos dawsoni** was a French priest, it might not be out of place to commend the Anthropologist of Oxford who has successfully aided in getting at the truth in this whole affair.

PLANT ANATOMY, CONTRIBUTIONS TO, by Irving W. Bailey; Chronica Botanica Co., Waltham, Mass., Stechert-Hafner, Inc., 31 E. 10th St., New York 3, N. Y. 1954. 259 pp., 23 pl., 28 text figs. $7.50

54-12081

Herewith are presented excerpts from the widely-scattered research reports on plant anatomy which have appeared from the industrious pen of the Chairman of the Institute for Research in General Plant Morphology at Harvard University. The compiler of this work, Elso S. Barghoorn, and the publisher prevailed on Dr. Bailey to make this selection. In his preface he says: "At the beginning of the century the older botanical disciplines had become rigidly compartmentalized and concerned with the application of stereotyped techniques. At present, the fixed boundaries between scientific disciplines are rapidly breaking down and diversified new techniques are being commonly applied. Thus, the papers in this book have been selected and arranged to illustrate successive attempts between 1909-1953 to bridge the gaps between plant anatomy and other fields of scientific endeavour."

PLANT BREEDING, METHODS OF, by H. K. Hayes, F. R. Immer and D. C. Smith; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 551 pp., 109 tabs., 64 figs. $8.50
54-10636

Discovery and interpretation have added so much to our fund of knowledge since this volume first appeared in 1942 that the surviving authors were forced to revise their original offerings. Dr. Immer died in 1946 but had already begun to accumulate data for this new edition. The authors continue to restrict this book to the crop plants, but chief additions have come in discussions of the center of origins of crop plants, expansion of data on heterosis, breeding for insect resistance, and the use of cotton and sorghum as representative crop plants often crossbred. There are 21 pages of bibliography, and a glossary of frequently used terms.

PLANT PATHOLOGY LABORATORY MANUAL, by Fulton, Slack, Fulton and Walters; Burgess Publishing Co., 426 Sixth St., Minneapolis 15, Minn. 1955. 82 pp., 16 pl. $2.75

Prepared by four members of the staff in Plant Pathology at the University of Arkansas, this laboratory manual is not divided up into the rigidly compartmented sections one comes to expect in most biological texts. There are, it is true, eight units devoted respectively to the bacteria, plasmodiophorales, phycomycetes, ascomycetes, fungi imperfecti, basidiomycetes, nematodes and to the viruses. A typical treatment under these headings includes (in the case of the damping-off fungus, **Pythium**): its etiology, symptoms, pathological histology, causal organism, disease cycle, and control.

PLANT PHYSIOLOGY, by Jacob Levitt; Prentice-Hall, Inc., 70 Fifth Ave., New York 11, N. Y. 1954. 172 pp., 46 figs., 26 tabs. $5.00
54-11106

From the laboratory and the classroom of a teacher of plant physiology in a one-semester course comes this new textbook. It has only twenty chapters, averaging about eight pages apiece, but it covers the field fairly well, especially at the undergraduate level. The author has accomplished this by dint of leaving out the lower plants, — most of the important ones being studied in bacteriology or microbiology anyway. He has confined himself to the vascular plants, which, after all, are the most important botanical life forms as far as physiology is concerned.

PLANT PHYSIOLOGY, LABORATORY, by B. S. Meyer, Don B. Anderson and Carroll A. Swanson; D. Van Nostrand Co., 250 Fourth Ave., New York 3, N. Y. 1955. 168 pp., 34 figs. $3.50
55-7830

This is the third edition of a standard lab manual which may, or may not accompany the senior authors' textbook. This edition follows its predecessors closely. Such changes as have been made are all in the interest of clarity and speed in getting on with the work of the course. Some experiments may be performed by demonstration, which is a decided advantage where getting over a lot of ground is essential to completing the course.

PLANT QUARANTINE PROBLEM, by W. A. McCubbin; Ejnar Munksgaard, 6 Norregade, Copenhagen, Denmark. 1954. 3 figs. Dan. Kron. 32, Sh. 22/9, $4.80

Anyone who wishes to get this book in a hurry should send his order to The Chronica Botanica Company, Waltham 54, Massachusetts. It should be on all library shelves because it is a complete summary of the whole story, pro and con, of plant quarantine by a man who was for 20 years connected with the U. S. Bureau of Entomology and Plant Quarantine. It is published with the knowledge and cooperation not only of his former Bureau, but also of the Bureau of Plant Industry, Soils and Agricultural Engineering. This lends it a species of authority that cannot be stared down. The eight chapters and appendix cover such little known yet important fields as the social and economic relations of plant quarantine, its legal features and administrative aspects, appraisal and outlook in its future development, and a historical summary.

PLANT TAXONOMY, by Earl L. Core; Prentice-Hall, Inc., 70 Fifth Ave., New York 11, N. Y. 1955. 459 pp., 125 figs. $7.50
55-10950

This is the first comprehensive plant taxonomy to cross our desk in some time. It is well gotten together, the first eight chapters dealing with the history of he science, the next five with principles and techniques, and the last seven with the principal families. The author is head of the department of botany at the West Virginia University.

PLANT TAXONOMY, AN INTRODUCTION TO. by George H. M. Lawrence; Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1955. 179 pp., 69 figs. $7.95

This is an abridged form of "The Taxonomy of Vascular Plants" published five years ago by the author, with a difference. Where that manual was designed to be used at least at the upper classman or graduate level, this is very definitely intended for undergraduates. Where that volume was amply and beautifully documented, this one is not. Very evidently this manual could be of use to the adult amateur botanist, or, as the author says, the student of local flora. At college level it should just about fit into a single semester introductory course, especially where the students have had an introductory course in botany or biology as a preparation. The introductory chapters are fairly brief and could be rushed a bit. They cover the definition of taxonomy, the systems of classification, evolution and its impact, plant structures, collecting and identifying techniques, nomenclature, phylogeny and biosystematics (the ecological angle) and a history of taxonomy in America as reflected in the accomplishments of about third of its leading scholars. This last is a delicious chapter. Thirty pages of plant family characteristics follow. The index and glossary are combined, an ingenious idea unused since T. Jeffrey Parker's 1891 edition of "Lessons in Elementary Biology," if we are not mistaken.

PLANTS WITHOUT FLOWERS, by Harold Bastin; Philosophical Library. 15 East 40th St., New York 16, N. Y. 146 pp., 10 figs. $6.00

As far as we know, this is the first attempt to publish a popular account of what used to be known as cryptogamic botany. The author was obviously writing for British and Continental readers, but the large number of excellent photographs gives us untravelled Americans a chance to see and compare mostly English plant forms with our own in the same or similar genera. The author's style is pleasant, and he keeps his matter quite free of scientific terminology, which for a technical botanist would be quite a feat. Those who are looking for an introduction to botany of the lower plants should do well to investigate this one.

PLANT WORLD, by Harry J. Fuller; Henry Holt and Co., 2626 Prairie Ave., Chicago, Ill. 584 pp., ill. $5.50
55-6016

This is the third edition of a one-semester-course textbook in which the author endeavors to present enough botanical facts and theories to satisfy those students who are getting only one semester of botany, and yet meet the requirements for a foundation to advanced work if they should become interested enough to come back for more. At least that's what the author hopes. But his students will probably get into atomic science, which happens to be the current craze. After fifty years of interest in plant science one comes to believe that botanists should start to beget other botanists at least in the grade school, and certainly not later than the high school. The number of college freshmen who land into Botany I courses without the slightest idea as to what it's all about is a scientific scandal. Dr. Fuller's book is a valiant attempt to cram into their heads in one semester all that they should have started learning in pre-Boy or Girl Scout days. At that, it looks as if he might be able to do it, given the right kind of an instructional staff.

POMP AND PESTILENCE, by Ronald Hare; Philosophical Library, 15 East 40th St., New York 16, N. Y. 1955. 224 pp. $5.75

The Professor of Bacteriology at St. Thomas's Hospital in the University of London has produced what one reviewer calls "a popular book in the best sense of the word: it is clear and lucid and highly readable; its subject is one of universal interest, and ranges from such historical episodes as the smallpox epidemic which, carried to Mexico by Cortes, did far more than the Conquistador to destroy the Aztecs, to wholly fascinating accounts of bacteriological detail about, for instance, the families that inhabit the throats of us all."

POND BOOK, by Albro Gaul; Coward-McCann, Inc., 210 Madison Ave., New York 16, N. Y. 1955. 136 pp., 35 pl. $2.75
55-6898

Dedicated "To all mothers who endure strange beasts in their home; and particularly to Frances, my wife, who even suffered leeches in her jelly jars," this new juvenile book by a former N.Y.C. Dept. of Parks and U.S.D.A. entomologist, strikes the right note from the start. It might be a fine Christmas present for a budding zoologist, beginning as it does with winter conditions and carrying on through into the Fall, providing you have a readily available pond, and a youngster who is curious about what is going on in it.

PRAIRIE, NORTH AMERICAN, by J. E. Weaver; Johnsen Publishing Co., Lincoln 8, Nebraska. 1955. 348 pp., 87 figs., 8 tabs. $5.00

The author of this much-needed treatise on one of our geat ecological complexes is, appropriately enough, professor emeritus at the University of Nebraska, with which he was connected for some 38 years. The forepart of the book is devoted to grasses and grasslands, together with their accompanying herbs, the forbs, as found either in lowlands or uplands. Next follows discussion of their roots and rhizomes, their stability, seasonal aspects, and plant-soil relationships. Spot studies in the eastern and western states come next. Then there are three chapters on drought relationships, and the book properly ends with the natural degeneration of the prairie, apart from human interference except for grazing. Plant conservationists, botanists and ecologists in general will welcome this valuable addition to their library shelves.

PROTEINS, THE CHEMICAL STRUCTURE OF, ed. by Wolstenholme and Cameron; Little, Brown & Co., 34 Beacon St., Boston 6, Mass. 1953. 222 pp., 49 ills. $6.00

This is another of the excellent symposium reports which are emanating from the CIBA Foundation. It is concerned mostly with the chemical side of the proteins as revealed by the newly developed methods which permit not only judging the purity of a protein, but also obtaining these substances in an exactly defined condition of purity. There are 24 internationally famous scientists figuring in these papers.

PRUNING MANUAL, by Everrett P. Christopher; Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1954. 320 pp., 53 figs., 12 ills. $5.00

In October 1952 Dr. Liberty Hyde Bailey, then nearly 95 years of age, wrote an introduction to this new revision of his oft-revised, 50-year-old classic manual. Dr. Christopher has produced what will serve for many more years as our standard manual of pruning. It has, as Dr. Bailey wished, been rewritten from start to finish. The results would have pleased the eminent botanical sage of Ithaca had he lived to see them.

RADIATION BIOLOGY, VOL. II, ed. by Alexander Hollaender; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 593 pp., ills., tabs. $8.00

53-6042

This, the second volume in the Radiation Biology series, is devoted to the ultraviolet and related radiations. The third volume will deal with visible light radiations, and the whole set when completed will replace the two-volume series edited for the National Research Council by Dr. B. M. Duggar, back in 1936. We have already favorably commented on the first volume. It remains to summarize the contents of the second. As the Editor notes in his preface, this book contains, in addition to its ultraviolet studies, much on high-energy radiation. Both parts of the spectrum induce similar biological effects, so no sharp line can be drawn between them. This volume is of more interest to microbiologists. The 14 chapters deal with photochemistry, sources of ultraviolet, sunlight, research techniques used, absorption spectra, cytochemical methods, effects on genes and chromosomes, effects on protozoa and some invertebrate eggs, viral relations, effects on bacteria, on fungi, photoreactivation, sunburn, and ultraviolet radiation and cancer.

—R—

RADIATION, BIOLOGICAL EFFECTS OF EXTERNAL, ed. by Henry A. Blair; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1954. 508 pp., ills., tabs. $7.00

This is Volume 2 of Division VI, Manhattan Project of Technical series. It reports on the work done at the University of Rochester in the National Nuclear Energy series. The book has three divisions, of which the first deals with single doses of whole-body X radiation, the second gives the result from chronic X radiation, and the third contains two chapters on fractionated doses of fast neutrons. Since there will be some 60 volumes of the declassified portion of the Nuclear Energy Series when it is completed, this present volume becomes something more than a mere report of work accomplished, it is part of the World War II history,—tangential perhaps, but none the less important as war-inspired research.

RADIATIONS ON LIVING CELLS, ACTION OF, by D. E. Lea; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1955. 416 pp., 86 tabs., 61 figs., 4 plates. $6.00

This is the revised edition of a work which **Nature** claimed to be the most important and authoritative work available dealing with the most fundamental actions of ionizing radiations on living cells. That was in 1946. Since then the author died, the book went out of print. To Dr. L. H. Gray of Mount Vernon Hospital, Middlesex, goes the credit for bringing the book up to date and incorporating the late author's proposed revisions into it.

RANGE MANAGEMENT, by L. A. Stoddart and A. D. Smith; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 433 pp., 156 figs., 69 tabs. $7.00

55-6172

This is the second edition of a manual which emanated from the Utah State Agricultural College thirteen years ago. At that time the authors pointed out that range management was a new and developing science. They have sought to bring their original offering in the field up to date. The results of their work will keep the friends they made, and make them new ones.

RED FOXES AND A DECLINING PREY POPULATION, by T. G. Scott and W. D. Klimstra; University Bookstore, Southern Illinois University, Carbondale, Ill. 1955. 123 pp., tabs., 20 & A to O, 14 figs. $2.00

The Illinois Natural History Survey

announces this as the first of a monograph series sponsored by Southern Illinois University. This paper-covered monograph has to do with the ecological effect of the elimination of fox feeding grounds and food materials on the red fox, **Vulpes regalis** Merriam, It boils down to the fact that the animals are being forced into types of predation which increase their destructiveness in the eyes of the farmer and therefore the consequent elimination process. Since the fox is of considerable value as a predator of economically dangerous rodents, as well as of considerable sports value, this paper may indicate a more enlightened attitude towards "Bre'r Fox."

ROCK BUILDING ALGAE AND ALGAL LIMESTONES, INTRODUCTION TO THE STUDY OF, by J. H. Johnson; Colorado School of Mines, Golden, Col. 1954. 117 pp., 62 pl. $2.50

Number 2, of Volume 49, Quarterly of the Colorado School of Mines, carries this lushly illustrated paper which was prepared by the Professor of Geology to meet the needs of his graduate students. It is well that his geologist and paleobotanist friends prevailed upon him to publish the paper so it could be made available more generally. As the author says, "to date very little work has been done in the fields of fossil algae and algal limestones by Americans.' It is to be hoped that his inspiration will start some among the American graduate student-group on this fascinating problem.

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SACRED FOREST, by Pierre D. Gasseau; Alfred A. Knopf, Inc., 501 Madison Ave., New York 22, N. Y. 1954. 247 pp., 35 pl. $4.00

54-7204

This is the story of how a professional adventurer and explorer with two companions sought to discover and photograph the secret rites of an African tribe in Upper Guinea where fetishism is still practised. In order to do so they let themselves be at least partially initiated into the tribe. There are some limits to which even the most scientific interest in primitive anthropology should have enough civilized dignity not to go. Perhaps these Frenchmen were neither scientific nor dignified. Apparently equating themselves to the underworlds of paganism didn't get them very far. Curiously enough in this same issue of the "Biologist" we have another book on a Frenchman among pagans, Andre Dupeyrat in "Savage Papua." Somehow or other we feel that Pere Dupeyrat has both the better story and the better solution to the problem of the primitive.

SARCOPHAGINAE, EVOLUTION AND TAXONOMY OF, by S. S. Roback; University of Illinois Press, Urbana, Ill. 1954. 181 pp., 34 pl., 9 charts, 1 fig. Cloth $5.00, Paper $4.00

52-124$6

Among the two-winged flies, the sarcophagidae are known as the "flesh" flies. In this monograph we have a study of one of the two groups in the flesh flies, the sarcophaginae, which run to some 1,200 species and range all the way from human parasites to dung and compost feeders. In his attempt to clear up the taxonomic problems concerned with their phylogeny, and generic groupings, the author has studied and prepared some 460 drawings which are grouped into the 34 plates mentioned above.

SAVAGE PAPUA, by Andre Dupeyrat; E. P. Dutton & Co., Inc., 300 Fourth Ave., New York 10, N. Y. 1954. 256 pp., 27 ills., maps. $3.75

54-5056

Of all the missionary groups in the South Pacific, the highest praise was given by the author of "A Doctor in Paradise" to the Missionaries of the Sacred Heart, whose work has been mostly confined to Papua and New Britain. What pleased the eminent representative of the Rockefeller Foundation most was the fact that these missionaries did not try to stamp out native culture along with native superstition. Now, for the first time in English, we have an authentic account of the motivation, the techniques, the successes and the failures of one of these Missionaries of the Sacred Heart in the Mafalu district of the Fuyughe country in the heart of the Papuan mountains. This is a bit north and west of Port Moresby which saw such a tremendous concentration of American and Australian army and air personnel during World War II. It is also on the border of the cannibal pagan areas. The author has not attempted to glossover the sordidness and the nameless horrors of life in "darkest Papua." Paul Claudel, former French Ambassador to the U.S.A., poet-member of the French Academy, says in his introduction to the work: "This is more than a mere narrative of adventure: it is an epic."

SCALE INSECTS OF NORTH AMERICA, by G. F. Ferris; Stanford University Press, Stanford, Calif. 1955. 233 pp., 94 figs., $7.50

37-4591

This seventh volume in the monumental monograph that Dr. Gordon Floyd Ferris has been slowly producing with much painstaking labor during the last fifteen years, is bringing the roster of scale insect families down from the Acleridae, through the Asterolecaniidae, the Conchaspidididae and the Dactylopiidae to the Lacciferidae. For the first time in the series, certain of the species, notably the Lacciferidae are not completely figured, due to the fact that Dr. J. C. Chamberlain's work of 28 years ago covered that group thoroughly. It is regrettable that the condition of Dr. Ferris' health will not permit him to complete the eighth and final volume of this series. It was to have included the Lecaniidae, Ortheziidae and the Margarodidae. Unless someone else takes it up where Dr. Ferris lays it down, it may very well be that the series will never see completion.

SCIENTIFIC LADY IN ENGLAND 1650-1760, by Gerald D. Meyer; University of California Press, Berkeley 4, Calif. 1955. 126 pp. Paper $1.50, Cloth $2.25

This is a study in English Literature which covers that brittle, superficial and affected epoch in England which followed the Reformation, Shakespeare and all the goodly company of the Mermaid Tavern. The subtitle "An Account of Her Rise, with Emphasis on the Major Roles of the Telescope and Microscope," gives a clue, but not too exact a clue, to the scope of the work. Even this does not go into too much detail. Lady Mary Wortley Montague introduced variolation into England, a forerunner of Pasteur and small-pox vaccination. She rates a comparative note in the preface. Of course Lady Mary did not write much about her activities which would seem to disqualify her from this study, even though Margaret Bryan's "Compendious System of Astronomy" of 1797 is included.

SEA WATERS, CHEMISTRY AND FERTILITY OF, by H. W. Harvey; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1955. 224 pp., 28 tabs., 64 figs. $5.40

This very basic study of environmental conditions for plant and animal life in the sea is divided into two parts. The first includes the composition of sea water, problems of mixing and lateral transport, changes due to presence of animals and plants, changes due to bacteria, factors influencing the growth of plants, and interrelations between plant production and animal communities. The section on sea water chemistry discusses in one chapter salinity, chlorinity, specific gravity, osmotic pressure and conductivity. Others are devoted to major constituents (sodium, magnesium, calcium, etc.), minor constituents (arsenic, copper, gold, etc.), the carbon dioxide system, dissolved oxygen, nitrogen and inert gases, and some analytical techniques. There are 16 pages of bibliography.

SEEDS OF LIFE, by John Langdon-Davis; Devin-Adair Co., 23 East 26th St., New York 10, N. Y. 1935. 172 pp., $3.00

55-7742

Quietly and objectively written, almost as a sage and experienced family doctor might have done so, this book is the story of nature's great experiment: from the fission of the first cell through all the other forms of multiplication: vegetable growth, as in the potato; hermaphroditism as in the snail, fertilization by 'remote control' as in the salmon—to the final development—the joining of two mammalian individuals in sexual union. Since an understanding of nature is to be found in sex, this book was written to give just that understanding. It tells the many ways in which living things, from the amoeba to man, reproduce. They are all here: the alga, malaria germ, snail, onion, orchid, termite, earthworm, robin, man himself. For those who have never had any courses in biology.

SEED PRODUCTION, VEGETABLE AND FLOWER, by L. R. Hawthorn & L. H. Pollard; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1954. 626 pp., 70 figs., 17 tabs., $7.50

53-11566

A horticulturist and an agricultural college head got together and produced this book after they had given a course on the subject in 1948. Much to their surprise they discovered that no one had ever written a textbook on the subject. The result of their labors is as clear as crystal, direct and simple, yet full of information otherwise hard to obtain. The publishers claim that this book will serve as a valuable aid to students, farmers, home gardners and professional seedsmen everywhere. We would like to add that even though colleges with botany departments may not be offering courses as technical as this subject would imply, their libraries could well afford to keep a copy of this book on their botanical reference shelves. It fills one of those gaps in our sources of information so obvious that we, like the authors, wonder why no one ever thought of doing it before.

SIGNS AND SYMBOLS IN CHRISTIAN ART, by George Ferguson; Oxford University Press, 114 Fifth Ave., New York 11, N.Y. 1955. 346 pp., 250 sk., 96 pl., 16 ills. in color. $10.00

In the foreword, Rush H. Kress quotes a twelve-year-old's impression of the text: "I found this book extremely interesting and charmingly written. The choice of words and the charming descriptions make it extremely enjoyable. I like the section about the animals and birds best. I also like the wonderful descriptions of different symbols of animals, birds, and butterflies, also insects." The author of this beautiful book had the resources of the Samuel H. Kress collection and the National Gallery of Art at his disposal. It is to be regretted that he had not the chance to work in some of the extant European works which feature even more of the symbolism than is found in the collections noted. "Paradeis Garten," in the Frankfort-am-Main Kunstmuseum belongs in this book. However, even without it, this is a wonderful buy for anyone who is interested in the artistic use and meaning of various symbolic plants and animals.

SMALL-FRUIT CULTURE, by J. S. Shoemaker; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 447 pp., 75 ills. $6.50
54-11318

When a book first published in 1934 has to be re-edited and reprinted in 1939, 1945, 1948 and 1950, and then for a third time put out in revised form this year, there must be a reason. Its ambit includes the culture of grapes, strawberries, bramble-fruits, currants and gooseberries, blueberries and cranberries. A bibliography of some 641 references, mostly **new**, concludes the working parts of the book. Dr. Shoemaker is Professor of Horticulture and the head of that department in the Ontario Agricultural College, Guelph, Ontario. Each type of crop is discussed from the standpoint of productive areas, development of varieties, their characteristics, duration of planting, propagation, types of seasonal planting, sites, soils, climate and weather factors, rotation, cultivation, irrigation, water supply, fruitbeds, fertilizers, harvesting and marketing, grading and packing, deep-freezing, plant diseases.

SMOKING, THE GENTLE ART OF, by Alfred H. Dunhill; G. P. Putnam's Sons, 210 Madison Ave., New York 16, N. Y. 1954. 177 pp., 28 figs., 14 plates. $3.75
54- 10495

In which a scion of the ancient profession of tobacconist makes an argument, an exposition and a plea for my Lady Nicotine. It is all done in such a quiet and scholarly fashion that one forgets that it is the work of a Dunhill. Nevertheless, the author makes a good case for the refinements of the smoking art, using history mainly as a springboard for the various modern uses of tobacco.

SOIL, by G. V. Jacks; Philosophical Library, 15 East 40th St., New York 16, N. Y. 1954. 221 pp., 10 pl., 6 figs., 4 tabs. $5.00

"The purpose of this book is to give the farmer, the student of agriculture and all who realize the importance of the cultivation of the land an insight into the new science of soil management," says the author in the preface. In simple languague he goes about describing the basic properties of all soils, and how they vary due to the way in which they were formed. Here are podzols, chernozems, solonets, gleys, all described in understandable words and figured in the best colored plates we have yet seen used on soils. A number of the illustrations are American in source, but the book was designed for British farmers. As Bobby Burns might have said (but didn't): "A soil's a soil for a' that."

SOIL CONSERVATION, ELEMENTS OF, by H. H. Bennett; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 358 pp., 108 figs., 17 tabs., 9 graphs $3.96
53-12044

Backed by an eight-page bibliography and a 9-page list of available visual aids, the "Father of Soil Conservation" returns to the endless battle with this new edition of his 1947 work. From 1935 to 1951 he was Chief of the Soil Conservation Service of the U.S. D.A. This gave him a fine opportunity to make the collection of some of the most drastic and dramatic photographs ever seen to illustrate his work. "Big Hugh" has projected his dynamic personality into this dynamic book. As a textbook it might fail on the score of "objectivity" but as an informative manual for reference and information it leaves absolutely nothing to be desired.

SOILS AND FERTILIZERS, by Firman E. Bear; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 420 pp., 157 tabs., 101 figs. $6.00
53-11879

Here, for the fourth time, the Professor of Agricultural Chemistry at Rutgers University, presents his matured considerations of the function of soil, analyses of its origin, nature, constituent elements and future needs. For over fifty years he has been watching the population of the continent increase, and as an ecologist and a conservationist at heart, he feels that the problem can be solved only on an understanding and control of the soil. His new and completely rewritten edition of his classic text features many of the new soil chemicals, new information on nitrogen, phosphorus, potassium, calcium and trace elements, tables brought up-to-date, 66 new illustrations, and newer estimates on crop plant yield potentials.

SPIDER, EGG AND MICROCOSM, by Eugene Kinkead; Alfred A. Knopf; 501 Madison Ave., New York 22, N. Y. 1955. 244 pp. $4.00
55-9287

One of the most eminent of the younger school of nature and scientific popularizers here picks up the lives and achievements of three of our most promising scientists and gives a brief but intensely interesting as well as stimulating account of their achievements. The author is a staff writer for "The New Yorker," and the men he admires are Dr. Alexander Petrunkevich, arachnologist, and Dr. Alexis Romanoff, the embryologist, and Dr. Roman Vishniac, the **microscopist** (our designation.) (Mr. Kinkead's publishers advertise Dr. Vishniac as a microbiologist, which is hardly fair. The large group of bacteriologists who are unwilling to distinguish between microbes and bacteria call themselves "microbiologists." From what the author has to say about Dr. Vishniac, we think he would hardly feel flattered by such a designation.) All three articles have some rather surprising statements of fact in them, not the least of which is Dr. Vishniac's story about the encysted amoeba from the wrappings of an Egyptial mummy which (the amoeba, not the mummy) when placed in water, broke its cyst and ambled away, 4,000 years to the contrary notwithstanding.

SPONSORED RESEARCH POLICY OF COLLEGES AND UNIVERSITIES, The American Council on Education, Washington, D C. 1954. 93 pp. $1.50
54-13145

This comprehensive study from the highest ranks of American education should be available in every biological library at the college level or higher. It serves as a channel between institutions of higher learning and those other agencies which envision the mutual benefits which research can confer on society in general.

STRANGE CREATURES OF THE SEA, by A. Hyatt Verrill; L. C. Page Co., 53 Beacon St., Boston, Mass. 1955. 233 pp., 40 ills., 11 pl. $3.75

Himself the son of the distinguished zoologist-geologist of Yale University, Addison E. Verrill, the author of this book has devoted his life more to the pleasures of exploration than to the rigors of the laboratory. The records of his trips are popularly written, and most are found in the "Strange Stories from Nature" series as published by L. C. Page. All of his works deserve a place on the public and high school library shelves. Since they contain few references to the work of others, and no bibliographies, they would, perhaps, be disqualified from place in university or college collections. This does not mean to belittle either their content or their style. Biologists have been for too long bemoaning the movement of students of science toward the atomic sciences. Maybe a little more of the explorer attitude at the high school level is in order. If so, Verrill's nine volumes should be available in every high school library, even if they cannot be made required reading.

STREAMS, LAKES, PONDS, by Robert E. Coker; University of North Carolina Press, Chapel Hill, N. C. 1954. 327 pp., 28 figs., 25 pl. $6.00

Distinguished from all the other books on aquatic life, this new book succeeds in making the technical terminology of aquatic ecologists intelligible to the average reader, without any sacrifice of scientific accuracy. It is divided into three main themes,—water and its content, running water and still water. A 16-page bibliography is complete enough to warrant the use of this book as a textbook. This is the type of intelligently organized work which is autoritative enough to merit a place on every college, high school and public library shelf.

STUDY HABITS, IMPROVEMENT OF, by Edward S. Jones; Foster and Stewart Publishing Corporation, Buffalo, N. Y. 1951. 127 pp.

This booklet has been reviewed before, but the revised eighth edition is worthy of another notice. Most of the readers of "The Biologist" are students, or in contact with them. To say that every student should read this treatise at least once, if only as a sort of scholastic "checkup," would be common sense. For advisers or counselors it might be a very desirable adjunct to their work. One could easily imagine the good that would be accomplished if an instructor could hand a copy of this manual to his badly adjusted, or mentally disoriented students. Unfortunately, by the time such situations are discovered those types of students are on their way out. As a checking-up process, however, this book has much to suggest.

SUN, SEA AND TOMORROW, by F. G. Walton Smith and H. Chapin; Charles Scribner's Sons, 597-599 Fifth Ave., New York 17, N. Y. 1954. 210 pp., 22 figs. $3.50
54-10374

Introduced by a few pithy paragraphs from the pen of Charles Kettering, this book is a study of the potential sources of food, minerals and power from man's last earthly boundary, the oceans. The book is an attempt, in other words, to suggest additional resources against the day when the increasing population of the earth will have used up all presently available. One of the authors is an oceanographer from Miami's Marine Laboratory. The other is an author who has made the sea the metier of some three or four books.

SURGERY OF THEODORIC, tr. by Eldrige Campbell and James Colton; Appleton-Century-Crofts, 35 West 32nd St., New York 1, N. Y. 1955. 223 pp., 1 col. pl. $.....
55-6228

The original of this work dates back to A.D. 1267. It was written by the son of Hugo of Lucca, who studied at the famous medical school of Salerno, and then practised at Bologna. The father was apparently an adept at military surgery, having been on at least one crusade, but unfortunately left no record of his surgical techniques. This was supplied by Theodoric, who constantly refers to his father's procedures. These are so modern in conception, and so thoroughly scientific by the highest canons of medical practise, that it is no wonder that a group of American and British army surgeons of the Mediterranean Theatre who met in Rome after its release discovered that some of their newer techniques were not so recent after all. Any student of the history of medicine,— or of biology, for that matter,— should get acquainted with this very unusual and revealing work, if only to realize that "there is nothing new under the sun."

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TAPES, SCRIPTS AND TRANSCRIPTIONS, EDUCATORS GUIDE TO, by W. A. Wittich and G. L. Hanson; Educators Progress Service, Randolph, Wisconsin. 1955. 158 pp. $4.75

With the development of radio and television, something like this had to come sooner or later. In the guide are listed 375 free tapes, 88 free scripts and 29 free transcriptions. The circulars: "Selecting and Using Audio Materials of Learning," and "The Use of Radio Scripts in Accomplishing Language Arts, Speaking and Speech Skills," will be furnished free on application. Those who have used the Educators Progress Service free films and film strips, will be glad for this new advance.

TAXONOMIC KEYS TO COMMON ANIMALS OF THE NORTH CENTRAL STATES, by Samuel Eddy and A. C. Hodson; Burgess Publishing Co., 426 South 6th St., Minneapolis 15, Minn. 1955. 141 pp., 685 figs. $3.00

This is the revised version of the original publication of 1950. For those who wish a more compact and readier reference than Pennak, Pratt, or Ward and Whipple, or who wish to use a more modestly priced key in classes of animal taxonomy, this spiral-bound manual should be a valuable assistance. As the subtitle indicates, the parasitic worms, insects and birds, are not included. The authors are members of the staff in the zoology department at the University of Minnesota.

THEORETICAL GENETICS, by Richard B. Goldschmidt; University of California Press, Berkeley 4, Calif. 1955. 563 pp., 16 figs., 6 tabs. $8.50

55-9881

The five parts of this comprehensive evaluation of modern genetics in all its aspects take up respectively the nature of the genetic material, the cytoplasm as the seat of genetic properties, the action of the genetic material, genetics and sex determination, and, genetic theory and evolution. Dr. Goldschmidt, for several years the honorary president of Phi Sigma, is too well known as a zoologist and a pioneer in modern genetics, to need any introduction to biologists. His massive work, with its 50-page bibliography, will probably find its chief use as a reference work, rather than a textbook for classes, except at the postgraduate level. It must be read, however, to be appreciated.

THIS IS DINOSAUR, ed. by Wallace Stegner; Alfred A. Knopf, 501 Madison Ave., New York 22, N. Y. 1955. 97 pp., 46 ills. (7 in col.) $5.00

55-8114

There are times when human rapacity out-rivals anything in nature. Nature may be relentless, at times, cruel, but it is the unconscious cruelty of brute or inanimate force. When man sets out deliberately to destroy natural beauty, historical monuments and prehistoric remains, there is little for his fellow men to be proud of. This book is the visual evidence of such a type of destruction that is to come if our fellow citizens do not wake up. The projected dams in the Echo Park country along the northern borders of Colorado and Utah would wipe out and submerge part of our natural heritage. The authors who have contributed to this book are all national leaders in the outdoor movement or professors in anthropology and geology. A copy of this book, which is not unreasonably argumentative ought to be in every one of the public, and not a few of the college libraries in this country. Those who wish to corroborate the arguments of these authors will find the fire they are hiding, burning brightly in "More Big Dam Foolishness" announced in this issue.

THIS WAS LOGGING, by Ralph W. Andrews; Superior Publishing Co., 2809 Third Ave., Seattle 11, Wash. 1954. 157 pp., 195 photos. $8.50

This is one of those rare events in botanical history where the long arm of chance reaches out and saves for posterity what might just as easily have been lost forever. Back in 1885 when the timber barons were beginning already to see the end of the productive forest in the East, and the midwest was beginning to show what was coming, there was a young photographer in Sedro-Woolley, Washington, who saw more of the beauty and romance of the big timber and the pigmy men who were denuding the mountain sides. Darius Kinsey took some 8,000 pictures by the old glass plate method in the earlier part of his career, and kept at it until 1940. The collection is still extant, and reprints from any negative are still obtainable. The present owner suggested this book to the author, and the team of owner, writer and publisher has made this, the finest pictorial record of early days in an industry, possible. Darius Kinsey has been praised as the Matthew Brady of Pacific Northwest Logging. After an hour with this book no one would dare to deny him the honor.

TREES AND SHRUBS OF THE UPPER MIDWEST, by C. O. Rosendahl; University of Minnesota Press, Minneapolis 14, Minn. 1955. 411 pp., 156 figs. $6.00

55-8489

The triangle which is bounded by

the eastern borders of the Dakotas, has its lowest point somewhere near the junction of the Wisconsin and the Mississippi Rivers, and reaches up to the northeastward along the shores of Lake Michigan, toward the Sault Ste. Marie area, and then back westerly towards Winnipeg, comprises the boundaries of this expanded manual which originally appeared in 1928 as **The Trees and Shrubs of Minnesota.** Its author is Professor Emeritus of Botany at the University of Minnesota. Some 345 species and 75 varieties are described in its pages, the figures of which are new and unusually well done for identification purposes. Anyone who is a native of the area, or who is teaching or collecting in the area, would do well and use this volume. For other professional botanists, and botanical libraries, its possession is recommended. Horticulturists and landscapers who wish to use local, or hardy adventitious, types of shrubs and trees in their plantings will want to see or own this book. The author has not confined his work to the native forms alone.

TUBEROUS BEGONIAS, by Worth Brown; M. Barrows & Co., 425 Fourth Ave., New York 16, N. Y. 1955. 128 pp., 36 ills., 4 pl. $3.50

This book should help to convince plant lovers that the tuberous rooted begonia is by no means as exotic and difficult to grow as some think. Curiously enough, although it is spectacularly brilliant in its colors, and by no means more difficult to grow than the African violet, it is still far behind in the race for popularity as a house plant. This is regrettable, for there is hardly a house plant, excepting perhaps the fickle and coy poinsettia (when you can get it to blossom), which is nearly so brilliant both in color and in size. This new manual by one of the foremost producers and growers of tuberous begonias should open up new avenues of effort towards lusciously exotic color in the home as well as in the garden or greenhouse.

—U—

UNDERWATER NATURALIST, by Pierre de Latil; Houghton Mifflin Co., 2 Park St., Boston 7, Mass. 1955. 275 pp., 24 figs., 15 pl. $3.50

55-7638

As a youngster the author became dissatisfied with the books he picked up here and there about fish. He decided that he would write one for boys himself. Living in Nice, midway between Monaco and Cannes, both of which boast of oceanographic centers, he was in an apt position to satisfy his cravings, more especially when the face mask was developed in 1937 by a fellow Nicois, Kramerenko, a former Russian. This was further stimulated when Commander de Corlieu brought out his rubber flippers for swimmers. The outfit was completed when Lt. Cmdr. Cousteau developed the aqualung as an adjunct to the underwater work of the French navy. Up to the end of WWII most underwater work was confined to demolitions activities by the Allied Forces. The underwater swimming techniques thus developed were taken over by Latil and others when peace was declared. In this book he tells the whole story, and dedicates it to the Prince of Monaco, himself an underwater hunter, because the book may stimulate science through sport, and sport through science.

UPLAND TRAILS, by Dan McCowan; Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 1955. 158 pp., 28 photos $4.00

From the Importations Department of The Macmillan Company comes this new book by the Broadcaster Laureate of the Canadian Rockies. Selected from his many broadcast programs for the Canadian Broadcasting Corporation, these twenty-nine chapters are none of them long, but all of them interesting. Selected at random from the chapter headings are: Birds at Play, Aurora, Lodgepole Pine, Waxwings, Butterwort, Hailstones, Broad-leafed Trees in the Canadian Rockies.

—V—

VASCULAR PLANTS OF ILLINOIS, by G. N. Jones and G. D. Fuller; University of Illinois Press, Urbana, Ill. 1955. 593 pp., 1377 maps. $10.00

53-9763

Here are 2,450 species of plants, from 785 genera, in 156 families and 54 orders, which form the flora of the Prairie State. 75 per cent of them are native "old settlers," the rest are migrants, mostly from Europe. The extensive bibliography listed under each species will be a valuable aid to future workers who will thus be able to see what has been done on each form in the area. This should obviate that old source of so much graduate botanical insecurity,— suppose someone has worked over all this material before? This compilation must have been not only laborious, it must have been Herculean. All the botanists not only living, but in the years to come, in Illinois, and in the neighboring states, too, owe Dr. Jones and Dr. Fuller a debt of gratitude which the mere chance, like this, of saying "Thank You!" seems such a silly and inadequate means of recognition. It might be more to the point if they bought this book, or at least requisitioned a copy for their institution's botanical library, budget and the librarian's "placet" to the contrary notwithstanding.

VEGETABLE GROWING, by J. E. Knott; Lea & Febiger, West Washington Sq., Philadelphia 6, Pa. 1955. 358 pp., 88 figs., 13 tals. $5.00

55-7846

This is the fifth edition of a textbook or farm manual which has become justifiably popular wherever truck gardening is practised. This fifth edition represents a considerable advance over its predecessor. It has been subdivided into three main sections, the first devoted to the main problem of getting things to grow and keeping them at it, despite the soil, the weather, the insects and the rot. It appropriately ends with storing and marketing the crop. The second part of the book deals with cool season crops, divided into perennials, potherbs and greens, cole crops, salad vegetables, bulb crops, beans and peas, and the potato. The last section, devoted to warm season crops, includes sweet potatoes, beans, solanaceous fruits, vine crops, and sweet corn. The newest developments in insect, blight and other pest controls are all here.

VERTEBRATE ANATOMY, ATLAS OF OUTLINE DRAWINGS FOR, by S. Eddy, C. P. Oliver and J. P. Turner; John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 1955. 106 ills. $3.25

The first edition of this work was devoted to the dogfish shark, necturus, and cat. To these have been added plates for amphioxus, and skull sketches for acipenser, lepisosteus and amia. The drawings are clear, and sufficiently detailed to cover as much as any instructor would care to use in a one-semester course, — with some eliminations. Each drawing sheet is perforated for removal so it can be turned in to the instructor. It is also perforated so that the checked, and corrected drawings can be returned to the owner for his notebook.

VERTEBRATE BODY, by A. S. Romer; W. B. Saunders Co., 200 W. Washington Sq., Philadelphia 5, Pa. 1955. 644 pp., 390 figs. $7.00

55-6342

Dr. Romer holds the Alexander Agassiz Professorship of Zoology and is the Director of the Museum of Comparative oZology at Harvard University. This second edition of his original work of 1949, has made some two thousand changes, large or small, in its text. In his interesting "Apologia" he sets up the standard he wishes to maintain: 1. Fairly adequate illustration. 2. A truly comparative treatment. 3. Proper paleontological background. 4. A developmental viewpoint. 5. Inclusion of histologic data. 6. Consideration of function. Even a casual inspection of the resulting new edition should convince the most critical that Dr. Romer has accomplished what he set out to do. The book is dedicated to two of his former professors at Columbia University, now retired, Drs. W. K. Gregory and J. H. McGregor.

VERTEBRATES, EVOLUTION OF THE, by Edwin H. Colbert; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 1955. 479 pp., 122 figs. $8.95

55-6663

The Professor of Paleontology at Columbia University, who doubles in brass as the Curator of Fossil Reptiles in the American Museum of Natural History, here presents the student who is interested in fossils, as well as the general reader with similar interests, with a textbook that anyone, even if he has not had specialized training in the field could understand. The book is well and clearly illustrated. There are four appendices, to include a classification of all the chordates, ten pages of classified references, a key to bone names used in illustrations, sources and credits for the illustrations.

VITAMINS IN THEORY AND PRACTISE, by L. J. Harris; Cambridge University Press, 32 East 57th St., New York 22, N. Y. 1955. 366 pp., 104 tabs., 103 figs. $6.50

Since 1935 this book has gone through four British editions, four in the U.S.A. and one in Dutch and another in Polish. Such a demand would seem to indicate that it is THE book on vitamins in general. From what we have seen of it we feel that the publishers are underrating its usefulness. A copy ought to be in every public library, in every high school library too. The only thing that stands in its way of being in every college and university library is its lack of documentation. This, of course, is understandable if one remembers that this book is aimed at "the lay reader." Professional people have their own resources in this line. To say that its professed aim "to include in language intelligible to the lay reader, some mention of at least every known fact of importance about the vitamins" has been successfully achieved would be an understatement.

—W—

WASP, THE HUNTING, by John Crompton; Houghton Mifflin Co., 2 Park St., Boston 7, Mass. 1955. 240 pp. $3.00

55-6948

Any time the word "wasp" is mentioned, most people who are not entomologists think only of the social, or stinging insects which make clay or paper nests, as wasps, not much caring whether they are wasps or hornets. About all they know is to distinguish between them and the bees, honey or bumble. Here we have the author giving us the saga of the hunting wasp, pretty much after the fashion with which he handled his previous books, "The Life of the Spider, The Ways of the Ant." In this case he is doing a good turn to an insect about which little is popularly known, yet which is one of humanity's friends, since it is a no mean predator on many pestiferous insects, or their larvae. The author has in the last four years attained quite an enviable reputation in the Fabre school of popularizing actual scientific facts.

WATER BEETLES OF FLORIDA, by Frank N. Young; University of Florida Press, Gainesville, Fla. 1954. 238 pp., 31 figs. $6.00 in paper
54-7230

What started out to be an ecological study wound up perforce as a taxonomic treatment of the nine aquatic beetle families found in Florida. Despite the taxonomic attack on the problem, the monograph is still refreshingly ecological.

WESTERN BIRDS, by Russell T. Congdon; Exposition Press Inc., 386 Fourth Ave., New York 16, N. Y. 1954. 408 pp., 185 ills. $9.00
54-5749

Surgeon and naturalist, the author of this very different book has contributed to the **Nature Magazine, Canadian Field Naturalist, Condor** and other publications. His colored films have appeared in the Walt Disney series of nature studies. Subtitled "The Observations of a Naturalist," his book is a beautiful collection of habit photographs of western birds with comments on bird behavior as seen by the photographer. Both as an observer and a cameraman, Dr. Congdon has no secrets up his sleeves. His last three chapters on bird photography, color photography, and photography with a moving-picture camera pass along to his readers some of the things he has learned in his fascinating hobby. Four excellent color photographs decorate the end-papers of the book.

WHALES, THE GREAT STORY OF, by Georges Blond; Hanover House, 575 Madison Ave., New York 22, N. Y. 1955. 253 pp., 23 ills. $3.95
55-5595

Translated into lucid English from the French by James Cleugh, this book has four very different chapters, each of which is complete enough to stand alone. The first deals with whales and whaling in general. The second is the life story of a whale. The third is a story reconstructed from the diary of a New Bedford whaler over a hundred years ago. The last chapter tells the story of modern whaling methods. Blond is a novelist and journalist who has wide experience in his chosen fields.

WILD FLOWERS AND HOW TO GROW THEM, by Edwin F. Steffek; Crown Publishers, Inc., 419 Fourth Ave., New York 16, N. Y. 1954. 192 pp., 100 ills., 50 in col. $3.95
54-6635

With color plates from the Rickett-Walcott edition of "Wild Flowers of America," this new book fills a long-open gap in American horticultural literature. The British have gotten a lot farther ahead than we have in this matter. Seventy-one groups of the woods and roadside favorites are here described, the habitats indicated, their blooming season listed, and a list of their more common species given, together with practical hints for transplanting. Most delightfully surprising is the author's adoption of the LaMotte terms for describing degrees of soil acidity, something that should have become universal years ago. The author is associate-editor of **Popular Gardening** and even the most casual inspection of his book would convince any horticulturist that "He knows his stuff."

WORLD OUTSIDE MY DOOR, by Olive B. Goin; The Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 184 pp. $3.50

"I have written this account of the biology of our back yard partly because I have found is so fascinating that, like all real enthusiasts, I want to talk about the object of my enthusiasm; partly because I hope that others interested in natural history, who would like to study animals but do not know quite how to begin, or who may feel handicapped by the lack of large natural areas and spectacular animals to observe, or who may simply need the spark to set them off, here may find suggestions, encouragement and incentive." (From the author's postscript.)

—X—

XIPHOPHORIN FISHES, MATING BEHAVIOR PATTERNS IN, by Clark, Aronson and Gordon; American Museum of Natural History, Central Park West at 79th St., New York 24, N. Y. 1954. 90 pp., 48 tabs., 9 pl., 10 figs. $1.50

This is the second article in Volume 103 of the American Museums Bulletin. It deals with the two sympatric species **Xiphopohorus .maculatus** (the .old **Platypoecilus** or "Platy") and **Xiphophorus helleri** (generally known as the "Swordtail"), and covers their inheritance and significance in sexual isolation. Careful observation, extensive reading and superior illustrations make this paper-bound reprint an interesting addition to any ichthyological library.

—Y—

YOUR PUPPY, by Leon F. Whitney; Hanover House, 575 Madison Ave., New YoYrk 22, N. Y. 1955. 192 pp., 45 ills., 4 tex. figs. $2.95
55-8411

Written in simple, non-technical language, this up-to-date handbook presents the best, the most practical, and the most authoratative medical advice on the care and training of puppies ever written. The author is well known for his research on animal diseases at Yale. He has written a number of authoritative articles for leading journals, and has three other books on dog or cat care to his credit.

—Z—

ZOOLOGY, by A. M. Winchester and H. B. Lovell; D. Van Nostrand Company, 250 Fourth Ave., New York 3, N. Y. 1955. 582 pp., figs. $6.25

55-6498

If we are not mistaken this book was favorably reviewed when it first came out in 1947. Since then it has gone through four reprintings, and now appears in revised form. It is intended for a beginner's course at the freshman level, and therefore leans over backward to be clearly understood, interesting and informative to those who use it. Since we have been authoritatively informed that: "Johnny Can't Read," this effort took some doing. Undoubtedly Drs. Winchester and Lovell do flunk some students, but it is not because as textbook authors they haven't tried to make things as simple as possible. There are a number of good illustrations, many of them from the senior author's own photography. Since the authors hail from Florida and Texas the book betrays a praiseworthy bias in favor of accenting the preventive medicine needed below the Mason and Dixon line. Textbooks of northern origin are more or less guilty of glossing over these subjects, which are still a part of our national health problem.

ZOOLOGY, ELEMENTS OF, by Tracy I. Storer and Robert L. Usinger; McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. 1955. 552 pp., ills., tabs. $5.50

55-6869

This is a boiled-down, shaken together version of the senior author's "General Zoology." Apparently he hasn't left much out. In fact, he has even expanded certain sections which were compressed in the larger work. There are review questions at the end of each of the 29 chapters. The authors have a companion "Laboratory Manual for General Zoology," and ten filmstrips to accompany this work if wished. There is a sixteen-page glossary and there are 23 pages of three-columned indices. If the book has a fault, and we are not sure that it is, it would be in the reduction of some of the illustrations. Line drawings can take more of this than photographs, and the latter have been cut down to a very small minimum.

ZOOLOGY, LABORATORY EXPLORATIONS IN GENERAL, by **Harl A.** Stiles; Macmillan Co., 60 **Fifth Ave.,** New York 11, N. Y. 1955. 291 pp. $3.75

This is the third edition of a loose-leaf punched laboratory manual, every page of which is detachable for insertion in a three or five ringed notebook. While this new edition is designed to accompany "Hegner & Stiles: **College Zoology,"** it could just as profitably be used with any other text, so long as the type forms and tissues discussed here are adequately covered in the parent textbook. Laboratory manuals, unlike textbooks, in the general sciences stay a long time on the market, being little affected by the changing tides of scientific discovery. That this one has held a substantial share of the field through three editions since 1943 speaks well for its general utility.

ZOOLOGY, LABORATORY MANUAL FOR ELEMENTARY, by Joseph G. Baier and others; Burgess Publishing Co., 426 South Sixth St., Minneapolis 15, Minn. 1953. 147 pp. $2.75

The zoology staff at the University of Wisconsin in the Milwaukee Department of Zoology have united to produce this work. It is pretty thoroughly based on dissection of the frog. Other living matter is introduced incidentally, generally as incidental work. There is no physiological experimenting to speak of. Considerable use is made of visual aids, such as models, charts, skeletons, and museum specimens.

ZOOLOGY, LABORATORY STUDIES IN ELEMENTARY, by Nellie M. Biltad, Lemuel A. Fraser and Harold R. Wolfe; Wc. C. Brown Co., Dubuque, Iowa. 1954. 83 pp., 35 figs., tabs. $2.00

This second edition of the practical lab manual which has been in use for nearly a quarter century in one form or another under Professors Guyer, Noland and Wagner, and which finally emerged in print in 1950. From the fact that there is no bibliography in it one would be justified in thinking that the lab manual rides on the tail of no textbook author's coat. It is complete as it stands, and constitutes a course in itself, irrespective of who is lecturing, or what text book is used as the peg to hang the course on. The authors are not green hands at the game of running lab courses. They are all old hands and the manual bears the evidence of experience.

Testimonial Deluxe

A patent medicine concern, seeking testimonials, received the following note of commendation:

"For eleven years I was totally deaf, but after using your pills for only one week, I heard from my brother in South Dakota."

—J.A.M.A.

EDITORIAL

OF MAKING MANY BOOKS

> *"Of making many books there is no end,—and much study is a weariness of the flesh."*
>
> ECCLESIASTES 12, 12

Those words are not the despairing cry of one of this year's crop of freshmen. They are not the profound reasoning of some worried graduate student. Nor do they emanate from the frustrations of some harassed college professor. In case you are curious enough to want to know, they were written by the wisest man in history, King Solomon, who reigned over Juda and Israel around 1,000 B.C.

If King Solomon were a magazine editor in 1955 and had any time left for business after giving the usual attentions to his 300 wives, he would find no need to improve on his ancient sententious conclusions. This has been an epoch of much book making, as this issue of *The Biologist* attests.

Many reasons have been suggested for this year's tidal wave of books in general, and the flood of books biological in particular. Some say it is due to the energetic solicitations of the publishing houses, big and little, who exist by publishing, and therefore must have something to keep their presses rolling. As evidence of this, the number of revised editions is pointed out. Others say that college professors who were swamped with teaching responsibilities during the tide of veterans just after the last World War, finally found a breathing space when that tide abated, and got their brain children furbished up to the point where they could thrust them out into the intellectual world. People who say this sometimes give the impression that these extroverting college professors are a bit worried over this possibility. The not too-distant tidal wave of future students they see building up on the open sea of population will have as restraining an effect on their own intellectual productivity as the veteran's ground swell did. So they are getting their books out now, while they have at least a modicum of leisure. Finally, there are a few rather antisocial asthenics who are circulating an underhanded suspicion that college professors are writing books in order to eke out the meagre pittances they receive, more to keep step with the faculty social whirl whose pace is set by the athletic coaches and the publicity staffs. Of course, no one really believes this but, man's reproductive urges being what they are, it is more logically probable that college professors are sublimating their reproductive instincts into the intellectual rather than the physical realm.

At any rate, they *are* writing books. And good ones, too. And the editor of any periodical which claims to have any professional shadings, is underselling his subscribers if he does not make at least a reasonable attempt to keep them informed of what is going on in the publishing field of their special interest. It has been the policy of *The Biologist*, ever since the present editor took over the responsibility back in February 1931, to make some effort in that general direction.

At first it was hoped that *The Biologist* could publish at least a few definitive book reviews in each issue. Such reviews were to be written by specialists in their own particular phase or field of biology. The editor was to be the middleman between the publisher and the reviewer.

A brave start was made. However, the reviews that came back from the specialists to the editor were few and far between. Often, after much tedious correspondence, when they did arrive, the book they discussed was nearly out of print. Publishers see no point in contributing books to professors who are not cooperative enough to review them promptly. Speed here, is of the essence. So the editor of *The Biologist* had to devise another plan.

He noted that many of the scientific magazines make no pretensions to reviewing every book that comes out, they are content to merely announce the book. Some, on the other hand, give only a brief summary of the book's contents, with only an occasional more or less critical opinion as to its prospective value. This last seemed to be the most feasible for a periodical like ours which has such a heterogeneous distribution.

A start was made by dropping the title "Reviews" from our book section. "Notes" was substituted. Each book was scrutinized to discover what its main features were, the group to which it might appeal. If it was very highly technical, its contents were listed in its own technical language or terminology. Thereby, the reader who discovered something he was interested in, or a terminological clue to something he was looking for, might be induced to buy the volume concerned.

Apparently this policy has appealed both to the readers of the periodical, and to the publishers. On the whole the former have been most encouraging. The latter have almost always been most cooperative, even when the editors-form-postal card requesting a review copy arrived not once, but two or three times. This has been an continual source of embarrassment. It is due to the fact that the College Librarian at the Editor's college regularly passes on to him his copies of PUBLISHER'S WEEKLY, *The American Book Trade Journal*, and from its pages the Editor selects the new items which might interest the readers of *The Biologist*. Since some volumes may be noted in this weekly publication not once but on three or four different occasions, it is not always easy to remember whether a book has been asked for or not. Some of the book review offices in the larger publishing houses, as a result, have probably formed the opinion that the Editor of *The Biologist* is a "typical, absent-minded, college professor." In which opinion, of course, they won't be far wrong.

Once the mailman delivers the book to be reviewed to the editorial precincts the Editor's moral responsibility to see that the book is objectively studied, honestly summarized and carefully written up, begins. So does the Editor's problems.

The worst problem of all is the publisher who merely slips the book requested into a mailer and slaps the Editor's address on it and rushes it forward through the mails. When the book arrives the Editor has to look through all the recent publishing literature, especially the *Cumulative Book Index*, to see what price the book is selling for. If it doesn't make "C.B.I." or the Editor can't trace back where he first saw the book announced, it is a foregone conclusion that the Editor will have to end the statistical part of his announcement with "Price Not Announced," or "Price Indefinite," or something to that effect. —Than which we could imagine no worse deterrent to anyone's ordering the volume.

On one score your Editor has an anxiety complex of no mean proportions. It is on the subject of numbering illustrations, not serially from the front to the back of the book, but by the chapter. It is a stupid custom which came in with the atomic literature during World War II. It is good to see that it is already going out of practise. In the books which used it, it was next to impossible to estimate the total number of figures used in a book.

Most often, however, when the book slips out of the mailing envelope or carton onto the editorial desk, its attractively printed jacket catches the Editor's eye. The jacket's inside flap begins a summary of the book's aims, contents, and, if it is a revision, some of its improvements over former editions. Inside the back flap of the dust-jacket often appears a brief biography of the author. In most cases, inside the front cover there will be a little form sheet with the publisher's complete address, the book's title, author, date for primary press releases, AND THE PRICE for which the book is to be sold. (Sometimes these data sheets include the number of pages and illustrations in the book.) Very often the back page of the dust-jacket will list other books by the author, or in his field, which the publisher has for sale. At the bottom of the sheet will be, again, the publisher's complete mailing address.

By the time the editor opens the book, to scan its table of contents or its index, and to check the number and nature of the illustrations, it only remains for him to see if the book lives up to, or falls short of his expectations. The only way he can do this is to adopt something that approaches the advice of Francis Bacon, Lord Verulam, (1561-1626), in his essay *"Of Studies."*

"Some books are to be tasted, others to be swallowed, and some few to be chewed and digested; that is, some books are to be read only in parts; others to be read, but not curiously; and some few to be read wholly, and with diligence and attention."

Following this sage advice, the Editor of *The Biologist* spent all there was of his last vacation between the summer session and the opening of the Fall term with his nose in some one of the books listed here. It was a bit hard on the eyes, and additive to his general corpulence. However, it has been a sort of refresher, if not a post-post-graduate course, to review and refurbish on so many subjects he once thought he knew, and had long since forgotten.

To the publishing houses which have cooperated so kindly with him, this Editor is much indebted.

The Next Number Will Be

"THE ALL-CHAPTER ISSUE"

Chapter Officers are requested to start collecting data on Chapter History, Famous or Honorary Members, etc.

THOUGHTS FROM "SYLVA"

Ontario Dept. of Lands and Forests Magazine
By R. V. Whelan

TORONTO—Sitting on a log in a boys' camp on Lake Timagami, a very small boy, little knowing how much wisdom he expressed, was heard to remark: "They tell me they are going to run electricity into this camp—if they do, I'll never come back!"

Centuries ago, when the first of many succeeding thousands of the distressed peoples of Europe sought independence and freedom in this new land, they toiled long and hard to push back the wild frontier and gain space in which to live.

To us, today, the word "frontier" evokes visions of tree-covered hills and valleys, and rivers flowing with clean, sparkling waters—simple beauty. The early settler, however, did not sing about it—he did not hate it—but because it was there, always had been, and — in his estimation — always would be, he partook of its healing qualities without conscious thought.

Throughout the centuries since, we have used the best stores of timber, soil, furs, waters and minerals which this land possessed, and with axe, plough and fire, rolled the frontier so far back that we have lost its healing influence. We have built our great cities and industries where once the sun set over forests of pine, but in doing so we have experienced great spiritual loss.

Even before we learned about psychiatry, family doctors—finding no organic ailments—were advising patients to take vacations and let Nature heal their hurts. So, like wounded animals seeking quiet rest beside the clear waters to recover, we have come to realize the healing qualities of woodlands — where the sighing of winds through the branches of tall pines, campfires under the stars, the call of a loon at sunset, and fighting trout on light tackle, soothe our tattered nerves.

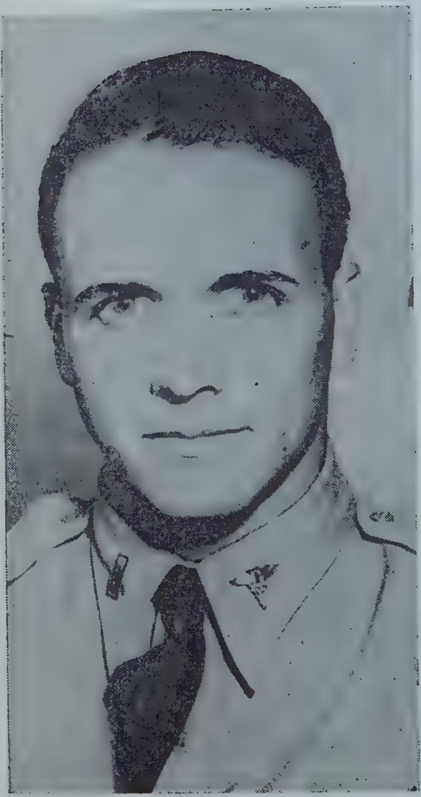
We have conquered many of the diseases that plagued our ancestors but are confronted with other ailments less easy to combat because they stem from the stress and strain, frustration, inescapable discipline, mental fatigue and spiritual exhaustion of modern life in urban centres.

For a while we sought relief at our theatres, movies, sports arenas and televisions—but this was not the answer. Slowly, in increasing numbers, we have become conscious of the restful, healing influence of the great out-of-doors—the same great outdoors in which our forefathers lived and worked.

So, today, though it be remote, we seek the great outdoors to escape—in family picnics beneath the trees along the highway, in week-ends at cottages and resorts, camping in tents or trailers beneath the starlit sky, hunting, fishing or just loafing under the sun. When, bumper to bumper, we return to the city, we may be physically tired—but how greatly refreshed in spirit!

Sometimes, during incautious moments, in our blundering search for peace, rest and solitude—and an opportunity to regain some sense of personal significance—we may burn, destroy and desecrate parts of our land.

Nevertheless, the more frequently we "get back to Nature," the more we, ourselves, learn why we must exercise wisdom and care in our use of our wildlife and forest resources—and how, through education to leave in the minds of our young folks so clear a picture of the spiritual and material meaning of soils, waters, forests, wild creatures and outdoor recreation that they, too, will love their land—and protect and cherish it always.

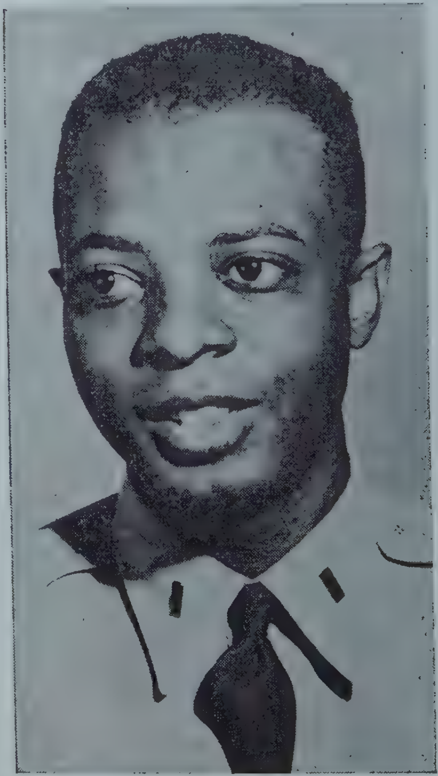


(U. S. Army photo)

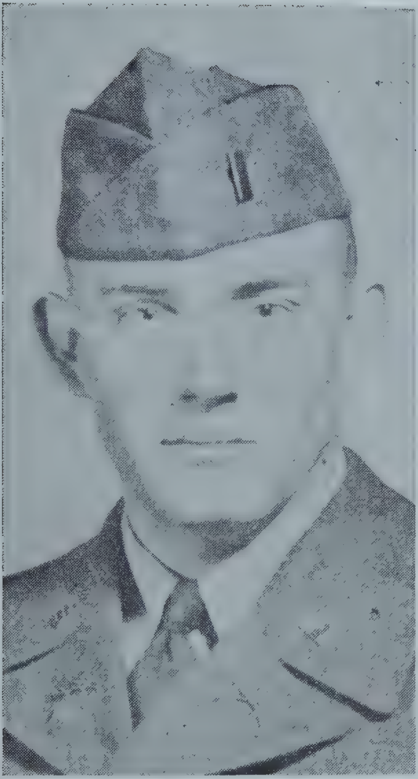
Army Air Force First Lt. Arthur J. Holder, son of Mr. and Mrs. L. D. Holder, McDonald, Pa., is taking his internship in medicine at Fitzsimons Army Hospital, Denver. Lieutenant Holder, whose wife, Jean, is with him in Denver, entered the Army last June. The lieutenant received his medical degree from Temple University's School of Medicine in Philadelphia this year. He is a member of the Phi Beta Kappa, Alpha Omega Alpha, Phi Beta Pi, Lambda Chi Alpha, Chi Epsilon Mu, and Phi Sigma fraternities. He is also a member of the Babcock Surgical Society.

DENVER, COLO.—Army 1st Lt. Richard L. Schultz, 27, son of Mr. and Mrs. Raymond Schultz, route 2, Poynette, Wis., recently arrived at Fitzsimons Army Hospital and is now a member of the 9953d Technical Service Unit.

Lieutenant Schultz entered the Army last August. A member of Gamma Alpha, Sigma Xi and Phi Sigma fraternities, he received his B.A. degree from the University of Wisconsin in 1948, his M.S. degree in 1950 and his Ph.D. degree in 1955.



Air Force 1st Lt. William D. English, son of Mr. and Mrs. Roy W. English, Lenapah, Okla., is taking his internship in dentistry at Fitzsimons Army Hospital, Denver. He is a graduate of Kent State University in Ohio and the Meharry School of Dentistry in Nashville, Tenn. Lieutenant English is a member of Alpha Phi Alpha and Phi Sigma fraternities.



(U. S. Army photo)

Army 2d Lt. Neil H. Douglas, son of Raymond J. Douglas, 703 Orchard lane, Stillwater Okla., recently was graduated from The Infantry School's basic infantry officers course at Fort Benning, Ga. Lieutenant Douglas entered the Army last February. He is a 1955 graduate of Oklahoma A & M College and a member of Kappa Sigma and Phi Sigma fraternities.

FORT BENNING, GA.—Army 2d Lt. John H. Deltano, 23, son of Mr. and Mrs. Louis A. Deltano, 109 S. Main st., Sharon, Mass., recently was graduated from the motor transportation course at The Infantry School, Fort Benning, Ga.

The course trains officers in motor transportation and maintenance duties of infantry units.

Lieutenant Deltano, in the Army 12 months, is a graduate of Boston University and a member of Phi Sigma and Scabbard and Blade fraternities.

CAMP DETRICK, MD.—Pvt. Garrett V. Keefer, son of Mrs. Bertha V. Keefer, 3036 Clyde ave., Schenectady, N. Y., recently arrived at Camp Detrick, Md., and is now assigned with the 9766th Technical Unit.

Private Keefer, who entered the Army last October, completed basic training at Fort Dix, N. J.

He graduated from Norwich University in 1952 and received his master of science degree from the University of New Hampshire in 1954. Keefer is a member of Lambda Chi Alpha and Phi Sigma fraternities.

CHAPTER OFFICERS AND ACTIVITIES

(As submitted by the Chapter Officers. The names of new members recently welcomed into Phi Sigma are furnished through the courtesy of the Council Secretary-Treasurer.)

BETA

—University of Michigan
Ann Arbor, Michigan

President: Leo C. Vander Beek (Botany)
Vice-Pres.: Dee C. Taylor (Anthropology)
Cor. Sec.: John B. Burch (Zoology)
Rec. Sec.: Llewella W. Hillis (Botany)
Treas.: Robert S. Whitmire (Botany)
Editor: Joseph H. Kite (Bacteriology)

IN THE PHI SIGMA CHAPTER:

The President —

1. Calls and presides at Chapter and Executive Committee meetings.
2. Conducts Initiations and Installations as Custodian of the Ritual.

The Vice-President —

1. Acts for and in the absence of the President.
2. Is Chairman of the Membership Committee and directs its activities.
3. Communicates with Council Secretary-Treasurer concerning new members and their records.
4. Is a member of the Executive Committee.

The Secretary —

1. Takes Roll Call at all Meetings.
2. Conducts all current Official Correspondence except pertaining to new members.
3. Keeps a file of all Chapter Correspondence.
4. Reports number of BIOLOGISTS needed to the Council Treasurer and Editor.
5. Distributes BIOLOGISTS to all Honorary, Faculty, and Chapter Members, as well as one to the campus Library.
6. Is Custodian of the Permanent File of all members.
7. Is Custodian of the Chapter Insignia and the Charter.
8. Is a Member of the Executive Committee.

The Treasurer —

1. Collects all Membership Fees and Local Dues.
2. Pays all Chapter local bills.
3. Transmits all Membership Fees to the Council Secretary-Treasurer, or Chapter Vice-President.
4. Is a Member of the Executive Committee.

The Editor —

1. Promptly reports all news-worthy Chapter Activities to the Council Editor.
2. Acts as Public Relations Officer for the Chapter.
3. Is not a voting member of the Executive Committee.

The Council Representative —

1. Advises Chapter Officers on Duties and Chapter Operation.
2. Functions for and with the Council Secretary in default of the local Chapter Officers.

EPSILON

—University of Denver
Denver, Colorado

President: L. Eugene Zumalt, 1843 S. Humboldt St., Denver, Colorado
Vice-Pres.: Vacant
Cor. Sec.: Gunther Schlager, 1480 S. Bryant St., Denver, Colorado
Rec. Sec.:
Treas.: Michael Dizdar, 1559 Williams St., Denver, Colorado
Editor:
Council Rep.: Dr. Frederick Zeiner, Dept. of Zoology, Univ. of Denver, Denver 10, Colorado
(Last year's Officers)

ZETA

—University of Wisconsin
Madison, Wisconsin

President: Byron Seymour Tepper, Dept. of Bacteriology
Vice-Pres.: William L. Colville, Dept. of Agronomy
Cor. Sec.: Francis R. Johnson, Veterinary Science
Rec. Sec.: Miss Wilma F. Aller, Dept. of Botany
Treas.: Robert Briggs, Horticulture and Agronomy Depts.
Editor: Charles Ruelke, Dept. of Agronomy
Council Rep.: Dr. Lowell E. Noland, 151 Birge Hall, Univ. of Wis.
(Last year's Officers)

John M. Salzer, Cincinnati, and Edward C. Miller, Peshtigo, both awarded Phi Sigma Certificates of Merit for excellence in biological work

ETA

—University of Akron
Akron, Ohio

President: Edward Morris, Dept. of Biology
Vice-Pres.: Richard Ellis, Dept. of Biology
Cor. Sec.: Kenneth Holloman, Dept. of Biology
Rec. Sec.:
Treas.: Raymond Damian, Dept. of Biology
Editor:
Council Rep.: Dr. Walter C. Kraatz, Dept. of Biology, Univ. of Akron

On June 15, 1955, the following were initiated: Roger Folke Keller, Jr. (Faculty), Edna May Fouet, Lois Irene Ahl, Henry George Koerber and Thomas Roberts Riley.

KAPPA

—University of Kansas
Lawrence, Kansas

President: Leland E. Keller, Dept. of Anatomy
Vice-Pres.: Peter S. Chrapliwy, Dept. of Zoology
Cor. Sec.: John M. Legler, Dept. of Zoology
Rec. Sec.: Richard W. Fredrickson, Dept. of Entomology
Treas.: Diana B. Amoss, Dept. of Biochemistry
Editor: Richard C. Fleming, Dept. of Zoology
Council Rep.: Mrs. Ruth E. McNair, Dept. of Biology

We have an interested and responsive chapter here at Kansas University and are planning some interesting programs for the future. I know the thought is shared by others, that "The Biologist" is an important link of the Society and is appreciated by all members. I feel that news from other chapters should be encouraged since it helps to bind the organization together as a whole and also suggests program ideas to the various chapters. I mention this point briefly at the beginning of the news item.

One of the big problems of any chapter is to plan an interesting and informative series of programs throughout the year. The chapter news in "The Biologist" is often helpful in that it suggests program ideas to other chapters. Kappa Chapter has enjoyed a successful program during the past year.

Our first lecture of the fall semester was given by Dr. Noble P. Sherwood, Professor Emeritus in the Department of Bacteriology. He presented a report on the 14th International Congress of the History of Medicine which he attended in Rome, Italy. At another meeting, Mr. A. C. Carpenter, President of the Kansas Academy of Science presented a general survey on, "The Geology of Kansas," illustrated with many colored slides and maps.

During the past spring we have had a program series dealing with the nature of research being carried on in the various biological departments on the campus. The following faculty members presented reviews of the research in their departments: Dr. H. W. Barrett, Dept. of Biochemistry; Dr. R. W. Baxter, Dept. of Botany; Dr. A. B. Leonard, Dept. of Zoology; Dr. K. E. Jochim, Dept. of Physiology; Dr. E. L. Treece, Dept. of Bacteriology; Dr. P. G. Roofe, Dept. of Anatomy; and Dr. C. D. Michener, Dept. of Entomology.

Our annual spring banquet was presided over by our past president, Wendell Showalter. The speaker of the evening was Dr. Webster H. Sill, Jr., Assistant Professor of Botany at Kansas State College, Manhatten, Kansas. His topic was, "Many Questions and a Few Answers Concerning Plant Viruses."

Our list of recent initiates includes: Richard Eli Bowen, Bacteriology; Henry Cecil Caldwell, Jr., Pharmacy; Barbara Louise Erickson, Entomology; Richard C. Fleming, Zoology; Earl W. Lathrop, Botany; Richard Newton Lolley, Pharmacy; Carroll Marshall Smith, Pharmacy; Park Wayne Wagers, Pharmacy; and Bernard Benjamin Watson, Botany.

LAMBDA

—Montana State University
Missoula, Montana

President: Howard S. Sears, Zoology Dept.
Vice-Pres.: Bruce Lloyd, 424 Evans
Cor. Sec.: Phylis Kind, 1107 Gerald Ave.
Rec. Sec.:
Treas.:
Editor:
Council Rep.: Dr. L. G. Browman, Zoology Dept.

(Last year's Officers)

NU

—Washington and Jefferson College
Washington, Pa.

President: Richard McCloskey, Hays Hall
Vice-Pres.: Craig Miller, 25 South College St.
Cor. Sec.: Paul Smilow, Upperclassmen Dormitory
Rec. Sec.:
Treas.: Allen Bress, 298 East Beau St.
Editor:
Council Rep.: Dr. C. D. Dieter, Dept. of Biology

(Last year's Officers)

PI

—Emory University
Georgia and Agnes Scott College
Decatur, Georgia

President:
Vice-Pres.:
Cor. Sec.:
Rec. Sec.:
Treas.:
Editor:
Council Rep.: Dr. W. B. Baker, Biology Dept.

RHO

—University of Illinois
Urbana, Illinois
President: John W. Matteson (Entomology)
Vice-Pres.: Bert Dabero (Zoology)
Cor. Sec.: Leslie Swartz (Zoology)
Rec. Sec.: Robert Claus (Botany)
Treas.: William Zebrunn (Zoology)
Editor: Norman Biggs (Physiology)
Council Rep.: Prof. Norman D. Levine, 163 Veterinary Med. Bldg.

SIGMA

—University of Florida
Gainesville, Florida

President: C. T. Adams, Sr., Dept. of Biology
Vice-Pres.: T. R. Hellier, Jr., Dept. of Biology
Cor. Sec.: Ruth Bronsweig, Dept. of Biology
Rec. Sec.: C. D. Wilder, Dept. of Biology
Treas.: John J. McCoy, Dept. of Biology
Editor: A. P. Black, Animal Husbandry and Nutrition
Advisor: Prof. A. S. Muller, Plant Pathology

With this new slate we are planning for a bigger and better year than any on record.

UPSILON

—Miami University
Oxford, Ohio

President: L. Barrie Hunt, Phi Kappa Tau House
Vice-Pres.: Miss Elizabeth Ann Kautz, 309 Hamilton Hall
Cor. Sec.: Russell G. Barnekow, 141 Ogden Hall
Rec. Sec.:
Treas.: John E. Ebinger, S4 Miami Lodges
Editor: Miss Mary Louise Hess, 300 Hamilton Hall
Council Rep.: Prof. David W. Bergstrom, Zoology Dept.
(Last year's Officers)

PHI

—University of New Hampshire
Durham, New Hampshire

President: Kenneth Hildreth, Zoology Dept., Nesmith Hall
Vice-Pres.: Miss Joanne Van Dyk, Zoology Dept., Nesmith Hall
Cor. Sec.: Miss Joan McTerney, Chi Omega, Durham, N. H.
Rec. Sec.:
Treas.: Garry Moushegian, Dept. of Zoology, Nesmith Hall
Editor:
Council Rep.: Dr. A. R. Hodgdon, Botany Dept.
(Last year's Officers)

CHI

—Montana State College
Bozeman, Montana

President: Miss Johanna Lee Haas, 503 West Cleveland, Bozeman
Vice-Pres.: Stanley Yamamoto, 606 West Olive St., Bozeman
Cor. and Rec. Sec.: Miss Vera Stucky, Dept. of Botany and Bacteriology
Treas.: Don Kenzcka, 13 "A" St., Bozeman
Editor:
Council Rep.: Dr. Mitrofan Afanasiev, Dept. of Botany and Bacteriology
(Last year's Officers)

PSI

—University of Washington
Seattle, Washington

President: Leo Parks, Microbiology
Vice-Pres.: Fred Leslie Clogston, Zoology Dept.
Cor. Sec.: Mrs. Lois Foster, Oceanography
Rec. Sec.: Miss Lucille Steelman, Anthropology
Treas.: Terry Buckridge, Fisheries
Editor: Mrs. Lois Foster, G 511 Health Sci. Bldg., Anatomy Dept.
Council Rep.: Dr. Mellville Hatch, Zoology Dept.
(Last year's Officers)

A very interesting year in Phi Sigma has just been concluded. All of our speakers but one were members of the University of Washington faculty, thus adding local color. Our meetings began in October, 1954, when Dr. L. M. Passano spoke on the role of marine stations in biological research, followed by Dr. Mellville Hatch's talk in November on his views of evolution. In January we heard about current aspects of polio research by the head of the Microbiology Dept., Dr. Evans. Dr. Klein of the same department spoke at our initiation meeting in March. Dean Gordon Castle of Montana State spoke at our election meeting in April which concluded the activities for our term of office.

The Award Certificate went to: Undergraduate, Dale Warren Cole.

—Lois Foster, Secretary

OMEGA

—University of Oklahoma
Norman, Oklahoma

President:
Vice-Pres.:
Cor. Sec.:
Rec. Sec.:
Treas.:
Editor:
Council Rep.: Dr. Paul R. David, Zoology Dept.
(Last year's Officer)

ALPHA ALPHA

—University of Southern California
Los Angeles, California

President: Herman Ainis, Dept. of Bacteriology
Vice-Pres.: Nathan Basson, Dept. of Bacteriology
Cor. Sec.: Miss Martha Jane Belknap, Dept. of Bacteriology
Rec. Sec.:
Treas.:
Editor: Nathan Basson
Council Rep.: Dr. W. V. Mayer, Dept. of Zoology

ALPHA BETA

—Mount Union College
Alliance, Ohio

President: Richard Untch, 2444 S. Linden Ave., Alliance, Ohio
Vice-Pres.: Edwin D. Bowers, R. D. No. 1, Sawburg Rd., Alliance, Ohio
Treas.: Joshua Odetoyinbo, Mount Union College, Alliance, Ohio
Sec.: Walter N. Webb, 2330 S. Seneca St., Alliance, Ohio
Council Rep.: Prof. O. H. Engle, 1409 Robinwood Rd., Alliance, Ohio

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ALPHA EPSILON

—University of Pittsburgh
Pittsburgh 13, Pennsylvania

President: Grant Doering
Vice-Pres.: Brother Robert Schullein
Cor. Sec.: Joseph Sunder
Rec. Sec.: Walter Donnellan
Editor: Dr. Clem Russ
Council Rep.: Dr. Peter Gray, Dept. of Biological Sciences
(Last year's Officers)

On 25 May 1955 the following joined Phi Sigma through Alpha Epsilon: Francis Dale Acklin, Raymond Burt Bloom, Joseph P. Buckley (Faculty), John LeRoy Campbell, II, Jack M. Capenos, Mary Elizabeth Clutter, Eugene W. Gettig, Jr., Rose Goldfield, James Herbert Graffius, William John Hudak, George Albert Keck, Maurice Lanier Moore, James Cyrenius Newcomb, Chung Sook Park, Frances Marie Pickle, Stephen John Solomon, Eliot Bruce Spiess (Faculty), Marshall Steinberg, Saverio Michael Zuffante.

ALPHA ETA

—Oklahoma A. & M.
Stillwater, Oklahoma

President: John Kind, 142 Brumbley, Stillwater, Okla.
Vice-Pres.: Daniel Russell, 311 N. Duncan, Stillwater, Okla.
Cor. Sec.: Miss Rosemary Ben Atkinson, 619 College Ave., Stillwater
Rec. Sec.:
Treas.: Sadrek Ayaub, 402 Cordell H., Oklahoma A. & M.
Editor:
Council Rep.: Dean C. H. McElroy, School of Vet. Medicine
(Last year's Officers)

Certificates of Award were given to: Undergraduate, Gus Wollard

Thornton; Graduate, A. L. Linder.

ALPHA IOTA

—Bucknell University
Lewisburg, Pennsylvania
President: Lydia Tiemann
Vive-Pres.: Barbara Lippincott
Sec.-Treas.: Barbara Josenhans
Editor:
Council Rep.: Prof. Roy C. Tasker, Biology Dept.

The Alpha Iota chapter of Phi Sigma at Bucknell University has recently initiated ten new members: Mary Flanders, Charles Hertz, Ardis Hinkle, Barbara Josenhans, Jeanette G. Leinbach, Barbara Lippincott, Margaret Sauer, Warren Schlanger, Rose Scicchitano and Emilie Sherman.

The Alpha Iota chapter has had two joint meetings with the new chapter at Penn State. On May 11, 1955 at Bucknell, Dr. Fringes of Penn State spoke on "The Semantics of Seagulls" and Dr. Hulda Magelhaes of Bucknell spoke on "Hamsters."

Members of the Alpha Iota chapter were present at the Penn State installation on May 19.

—Lydia Tiemann

Along the personal line of news for *The Biologist*, Theodore Smayda, President of Alpha Xi chapter of Phi Sigma at the University of Rhode Island during the year 1945-1955, has been awarded a Fulbright Scholarship. He is studying marine biology under Dr. Braarud at the University of Oslo, Norway. He graduated from Tufts in 1953 and received his Master's degree from the University of Rhode Island in 1955.

The Phi Sigma Award went to: Undergraduate, Thomas Jackson Cook.

ALPHA KAPPA

—Hunter College
695 Park Ave.
New York 21, N. Y.

President: Miss Jo-Anne Badami, 4365 Grave Ave., Bronx 66, N.Y.
Vice Pres.: Miss Harriet Entih, 98 Van Courtland Park South, Bronx 63, N. Y.
Cor. Sec.: Miss Rosalie Hait, 1212 Lldig Ave., Bonx 68, N. Y.
Treas.: Miss Selma Moskowitz, 2158 Mapes Ave., Bronx 60, N. Y.
Editor:
Council Rep.: Dr. Harold H. Clum, Biology Dept.
(Last year's Officers)

On 27 May the following received membership: Bernice S. Goldberg, Lorraine Moskowitz, Janet Gross, Bella S. Chabot, Mildred Iona Clarke, Joan Sandra Weinberg. The 1955 Phi Sigma Award went to: Undergraduate, Mary Louise Payne.

ALPHA LAMBDA

—University of Utah
Salt Lake City, Utah

President: Gerald D. Brooks, 1175 E. 2nd St., South
Vice-Pres.: John C. Frandsen, 342 Douglas St.
Cor. Sec.: Miss Sandra Shuler, 434 S. 13th, East
Rec. Sec.:
Treas.: David W. Newman, 465 S. 12th, East
Editor:
Council Rep.: Dr. Stephen D. Durrant, 1381 S. 10th East, Salt Lake City, Utah
(Last year's Officers)

On May 21 the chapter inducted: Dean Martin Andersen, Russell Daniel Anderson, Alan Claymore Bartlett, Le Roy Behling, Franklin Ruggles Cole, Gerald Neil Fassell, Robert Eugene Fechner, Paul Arthur Furr, E. Arnold Isaacson, Wallace Hadfield Jensen, Stanley Allen Mulaik, William Wuncan Patterson, Jr., Douglas L. Smith, Jean Alyn Vallandingham, Dean Hedric Weaver, Earl Abbott Wight and Le Roy Hugh Wullstein.

ALPHA MU

—Oregon State College

President: Cyrus McKell, Botany Dept.
Vice-Pres.: Brian McNab, Zoology Dept.
Sec.: Allan Steinhauer, Entomology Dept.
Treas.: Stanley Wilkes, Zoology Dept.
Editor: Norman Goetze, Farm Crops Dept.
Cor. Sec.: Rod V. Frakes, Farm Crops Dept.
Advisor: Dr. Ivan Pratt, Zoology Dept.
(Last year's Officers)

On June 2 the chapter inducted Te Chang Huang to membership.

ALPHA NU

—University of New Mexico
Albuquerque, New Mexico

President: Harold George Scott, Dept. of Biology
Vice-Pres.: Chester R. Richmond, Dept. of Biology
Cor. Sec.: Miss Valerie Ernst, Dept. of Biology
Rec. Sec.: Miss Edith Bratton, Dept. of Biology
Treas.: Miss Winnefred Matthews, Dept. of Biology
Editor: Miss Virginia Avis, Dept. of Biology
Council Rep.: Dr. Edward F. Castetter, Dept. of Biology

Alpha Nu chapter is in deep mourning for one of its most esteemed and respected members, Dr. Richard B. Johnson, Professor of Bacteriology, who died after only a few days illness from cancer. He was just 37 years of age, and only weeks before his death he had completed work on an immunization technique for "infant diarrhea" (bacillary dysentery) which has occupied the last ten years of his life. It will be reported in the *Journal of Immunology*.

This great scientist's death so shocked our department that we came to a total standstill from which we have hardly recovered as yet. He had been a member of this chapter for eight years. He died April 19, and has been buried in Salt Lake City.

Dr. Johnson took his bachelor's degree from Utah State Agricultural College and his doctorate from Cornell University. During World War II he was a bacteriologist officer with the Air Force and survived being shot down twice during his military service. He was serving as bacteriologist on the New Mexico State Board of Basic Science Examiners, and as a consultant to the Lovelace Foundation and Santa Fe Hospital upon his death. He was a member of the University Research Committee.

He was a member of the Lutheran Church, American Association of Bacteriologists, Phi Sigma, Sigma Chi, and the American Association for the Advancement of science.

* * * * *

As retiring president of this chapter of Phi Sigma, I wish to express my appreciation to you and to the members of this chapter who made my term of office so enjoyable. John DaVanzo, a doctoral candidate at this university, will make an excellent president, and our chapter is proud to have him in that position.

Sincerely yours,
Harold George Scott
Retiring President
Alpha Nu Chapter

ALPHA XI

—University of Rhode Island
Kingston, Rhode Island

President: Theodore Smayda, Marine Biological Lab.
Vice-Pres.: Earle Travis
Cor. Sec.: Alan Hunter
Rec. Sec.: Miss Barbara Bowers
Treas.: Richard Boyle
Editor: Edward Tillinghast
Council Rep.: Prof. Robert R. DeWolf, Zoology Dept.
(Last year's Officers)

The chapter nominated Edward K. Tillinghast for the Award.

ALPHA OMICRON

—Marquette University
Milwaukee, Wisconsin

President: Robert J. Kinney, 2905 W. Wisconsin Ave., Apt. 906, Milwaukee
Vice-Pres.: John Mittelstaedt, 3743 N. 41st St., Milwaukee
Cor. Sec.: Miss Helen Wood, Biology Dept., Marquette University
Rec. Sec.: Miss Jacqueline Garner, Biology Dept., Marquette University
Treas.: Richard J. Vogl, 2417 N. 38th St., Milwaukee
Editor:
Council Rep.: Dr. James Barrett, Biology Dept., Marquette University
(Last year's Officers)

Undergraduate Robert William Korn was the recipient of the Award.

ALPHA PI

—University of Colorado
Boulder, Colorado

President: Albert W. Johnson, 954 8th St., Boulder
Vice-Pres.: Robert Higgins, 2404 Water, Boulder
Cor. Sec.: Miss Kathleen Beargle, 210 Arapahoe, Boulder
Rec. Sec.: Miss Arline Avrick, 1415 Broadway, Boulder
Treas.: Miss Deborah Merrill, 1025 15th St., Boulder
Editor:
Council Rep.: Dr. Edna Johnson, Botany Dept.
(Last year's Officers)

ALPHA RHO

—University of Arkansas
Fayetteville, Arkansas

President: Glen J. Dixon, Dept. of Botany and Bacteriology
Vice-Pres.: Billy G. Diggs
Cor. Sec.: John R. Bagby
Rec. Sec.:
Treas.: Shelby M. Smith
Council Rep.: Dr. Delbert Swartz, Dept. of Botany and Bacteriology

ALPHA UPSILON

—University of California at Los Angeles
Los Angeles 24, California

President:
Vice-Pres.:
Cor. Sec.:
Rec. Sec.:
Treas.:
Editor:
Council Rep.: Dr. Bernard O. Phinney, Dept. of Botany
(Last year's Officer)

ALPHA PHI

—College of Puget Sound
Tacoma, Washington

President: Charles C. Kruger, College of Puget Sound
Vice-Pres.: Mrs. Irene Creso, Spanaway, Wash.
Cor. Sec.: Charles B. Arnold, Jr., College of Puget Sound
Rec. Sec.: Jack Cowan, 515 6th St., N. W., Puyallup, Wash.
Treas.:
Editor:
Council Rep.: Dr. Gordon D. Alcorn, Biology Dept., College of Puget Sound
(Last year's Officers)

ALPHA CHI

—University of the Philippines
Quezon City, Philippines

President: Zenon Torres, Bureau of Fisheries, Manila
Vice-Pres.: Joventino Soriano, Dept. of Botany, College of Liberal Arts, University of the Philippines
Cor. Sec.: Miss Fanny Cid, 338 Tennessee, Malat, Manila
Rec. Sec.: Miss Cecilia Vargas, Dept. of Botany, College of Liberal Arts, University of the Philippines
Council Rep.: Dr. Gregoric T. Velasquez, Dept. of Botany, College of

Liberal Arts, University of the Philippines

(Last year's Officers)

Undergraduate, Mateo A. Sanchez and Graduate, Paulina Demerry-Pages were given the Phi Sigma Award.

ALPHA PSI

—Virginia Polytechnic Institute
Blacksburg, Virginia

President: Paul H. Smith, Box 4194, Va. Tech. Station, Blacksburg, Va.
Vice-Pres.: Edwin O. Willis, Box 6392, Va. Tech. Station, Blacksburg, Va.
Cor. Sec.: Warren H. Taylor, Box 5936, a. Tech. Station, Blacksburg, Va.
Rec. Sec.: James R. Brennan, Box 3686, Va. Tech. Station, Blacksburg, Va.
Treas.: Charles B. Wood, Box 3642, Va. Tech. Station, Blacksburg, Va.
Editor: Floyd E. Jarvis, Box 4206, Va. Tech. Station, Blacksburg, Va.
Council Rep.: Dr. Kendall W. King, Dept. of Biology, V. P. I., Blacksburg, Va.

(Last year's Officers)

On 19 May the following received membership: John Grove Barker, Andrew Bowie Beasley, William David Ditman, Charles Edward Hamner, Jr., Richard Thomas Heath, David Fleetwood Long, John Burton Redd, Jr., Robert Blaine Thomas, Thomas Albert Waddill, Phillip Keith Harein, Littleton Wales Johnson, William Reid Williams, Jr.

ALPHA OMEGA

—University of Georgia
Athens, Georgia

President: Daniel J. Nelson
Vice-Pres.: Philip Coleman
Sec.: Ellyn Duggar
Treas.: L. R. Poe, Jr.
Editor: Edith De Zoort
Faculty Advisor: Dr. J. J. Westfall
Council Rep.: Dr. Elon E. Byrd

With the close of the fourth year of active membership, the members of the Alpha Omega chapter of Phi Sigma Society would like to report that we have had very enjoyable and enlightening activities and meetings.

Our new officers were elected Winter Quarter, March 9, 1955. They were installed at our annual banquet, March 30, 1955. Following the installation ceremonies, Dr. Lawrence C. Curtis, Professor of Horticulture at the University of Georgia, was introduced as our speaker for the evening. Dr. Curtis' speech, "Travelogue: North Africa," was very interesting.

Twenty-seven new members were initiated in Alpha Omega chapter this year. Eleven were initiated Winter Quarter, Jan. 12, 1955. They were: Augostino Carlucci, Fred Chambliss, Edith De Zoort, Everett Kuglar, Jack Lowe, Lynn Marston, Dr. Robert McGee, Thomas Monaghan, John Parker, Ralph Poe, Jr., and Charles Speegle. Sixteen were initiated Spring Quarter, April 27, 1955. They were: John Bower, Cilia Calloway, Clyde Connell, John Gentry, William Gray, Marie Lanier, James Ludwig, Robert Luikfield, James McIntyre, Birch McMurray, Eugene Messerman, Florence Rose, Al Smalley, Eric Thompson, Richard Williams and Edwin Everhart.

At our last meeting, May 24, 1955, Dr. J. J. Westfall presented the Phi Sigma Awards. For graduate work: Mary Dunn; for undergraduate work: Edith De Zoort. The Chapter Award for outstanding junior was awarded to Edith De Zoort. After the awards were presented, Dr. Westfall introduced our speaker for the evening, Dr. E. J. Parizek, who addressed the chapter on "Vertebrate Life ow the Mesozoic."

—Edith June De Zoort

Back row: Howard Erickson, Robert Chambers, Charles Ely, Bertil G. Anderson, T. H. Cheng, Eugene Waldbauer, Franklin Little, Mrs. Mabel Frings. Front row: John Parsons, Steven Babcock, Karlee Buhman, Mrs. Rae Chambers, Elizabeth Nutter, Betty Slocum, Caroline Hamblin, Roberta O'Dell, Jacques Berger, P. F. English, John Chemsak. Seated: Carl Stohler, Adam Anthony, Hubert W. Frings.

BETA ALPHA

—Pennsylvania State University
State College, Pennsylvania

President: Robert E. Chambers
Vice-Pres.: Kay L. Buhman
Sec.: Eugene C. Waldbauer
Treas.: John A. Parsons
Council Rep.: Dr. Hubert Frings

Beta Alpha chapter of Phi Sigma was initiated on 26 May 1955, at Pennsylvania State University.

Installation of Officers was conducted prior to the dinner. Dr. K. F. Lagler, National President from the University of Michigan, and Dr. F. S. Orcutt, Executive Secretary from Virginia Polytechnic Institute, presided at this meeting.

Dr. Roy C. Tasker and five other student members from the Alpha Iota chapter, Bucknell University, were also present at our initiation dinner.

The following faculty and students were received at the initial dinner meeting: Dr. Bertil G. Anderson, Head, Department of Zoology and Entomology; Dr. Norris Dwight Blackburn, Professor of Entomology; Dr. Tien Hsi Cheng, Professor of Zoology; Dr. Hubert Frings, Professor of Zoology; Dr. P. F. English, Professor of Wildlife Management; Dr. Adam Anthony, Professor of Zoology; and Mrs. Hubert Frings.

Student members: Roberta O'Dell, Robert Chambers, Betty Slocum, Steven Babcock, Jacques Berger, Rae Chambers, John Chemasak, Charles Ely, Howard Erickson, James Fisher, Caroline Hamblin, Harold Little, Elizabeth Nutter, Carl Stohler and Eugene Waldbauer.

Officers: Robert E. Chambers, President; Kay L. Buhman, Vice-President; Eugene C. Waldbauer, Secretary; John A. Parsons, Treasurer; and Dr. Hubert Frings, Faculty Advisor.

Eugene Waldbauer
Secretary, Beta Alpha

INITIATION INSIGNIA

Does your chapter carry out the Ritual of Initiation properly? In other words, has your Chapter the model Phi Sigma Key and the large Phi Sigma Coat of Arms required by the Ritual? They are both in easy reach of every Chapter's finances. Current prices quoted upon request to the Executive Sec.-Treas., Dr. F. S. Orcutt, Hillcrest Drive, Blacksburg, Va.

PHI SIGMA JEWELRY

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DIRECTORY
Of All Chapters

*Indicates Temporary Inactivity

*ALPHA—Ohio State University, Columbus, Ohio, 17 March 1915.

BETA—University of Michigan, Ann Arbor, Michigan, 3 June 1916.

*GAMMA—North Dakota Agricultural College, Fargo, North Dakota, (1916).

*DELTA—University of Maine, Orono, Maine, 27 January 1917.

EPSILON—University of Denver, Denver, Colorado, 5 March 1917.

ZETA—University of Wisconsin, Madison, Wisconsin, 30 May 1917.

ETA—University of Akron, Akron, Ohio, 20 April 1921.

*THETA—Michigan State College, Lansing, Michigan, 9 April 1921.

*IOTA—Washington University, St. Louis, Missouri, 28 May 1921.

KAPPA—University of Kansas, Lawrence, Kansas, 31 May 1921.

LAMBDA—University of Montana, Missoula, Montana, 4 May 1921.

*MU—University of California, Berkeley, California, 27 April 1922.

NU—Washington and Jefferson College, Washington, Pennsylvania, 11 May 1922.

*XI—University of Nebraska, Lincoln, Nebraska, 3 May 1924.

*OMICRON—University of North Dakota, Grand Forks, North Dakota, 26 May 1924.

PI—Emory University, Georgia, 3 January 1925.

RHO—University of Illinois, Urbana, Illinois, 28 March 1925.

SIGMA—University of Florida, Gainesville, Florida, 4 December 1925.

*TAU — Duke University, Durham, North Carolina, 4 March 1926.

UPSILON—Miami University, Oxford, Ohio, 7 May 1926.

PHI—University of New Hampshire, Durham, New Hampshire, 21 May 1926.

CHI—Montana State College, Bozeman, Montana, 11 February 1927.

PSI—University of Washington, Seattle, Washington, 7 April 1928.

OMEGA — University of Oklahoma, Norman, Oklahoma, 24 March 1928.

ALPHA ALPHA—University of Southern California, Los Angeles, California, 17 May 1928.

ALPHA BETA—Mount Union College, Alliance, Ohio, 17 May 1928.

*ALPHA GAMMA—University of South Dakota, Vermillion, South Dakota, 15 May 1928.

*ALPHA DELTA—Lawrence College, Appleton, Wisconsin, 17 March 1929.

ALPHA EPSILON — University of Pittsburgh, Pittsburgh, Pennsylvania, 23 March 1929.

*ALPHA ZETA — College of William and Mary, Williamsburg, Virginia, 19 April 1930.

ALPHA ETA—Oklahoma Agricultural and Mining College, Stillwater, Oklahoma, 13 March 1930.

*ALPHA THETA—State College of Washington, Pullman, Washington, May 1930.

ALPHA IOTA—Bucknell University, Lewisburg, Pennsylvania, 9 January 1932.

ALPHA KAPPA—Hunter College, New York City, 8 January 1932.

ALPHA LAMBDA—University of Utah, Salt Lake City, Utah, 13 February 1932.

ALPHA MU—University and State College of Oregon, Eugene-Portland-Corvallis, Oregon, 18 November 1933.

ALPHA NU—University of New Mexico, Albuquerque, New Mexico, 21 April 1935.

ALPHA XI—University of Rhode Island, Kingston, Rhode Island, 17 May 1935.

ALPHA OMICRON—Marquette University, Milwaukee, Wisconsin, 18 June 1938.

ALPHA PI—University of Colorado, Boulder, Colorado, 24 May 1941.

ALPHA RHO—University of Arkansas, Fayetteville, Arkansas, 23 May 1945.

*ALPHA SIGMA—University of Texas, Austin, Texas, 2 February 1946.

*ALPHA TAU—National University of Mexico, Mexico, D.F., 7 April 1947.

ALPHA UPSILON—University of California at Los Angeles, California, 17 May 1947.

ALPHA PHI—College of Puget Sound, Tacoma, Washington, 28 February 1948.

ALPHA CHI—University of the Philippines, Manila, Luzon, P.I., 12 March 1949.

ALPHA PSI—Virginia Polytechnic Institute, Blacksburg, Virginia, 24 May 1949.

ALPHA OMEGA—University of Georgia, Athens, Georgia, 17 May 1951.

BETA ALPHA—Pennsylvania State Univ., State College, Pennsylvania, 26 May 1955.

THE BIOLOGIST

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MILE POSTS

1915	**March 17, Alpha Chapter organized, Ohio State University, Columbus.**
1916	**May, Central Governing Body organized, "Biologist" first issued.**
1924	**December, First National Meeting, Constitution revised, Washington, D. C.**
1925	**December, Second National Meeting, First Science Program, Kansas City.**
1926	**December, Third National Meeting, Second Science Program, Philadelphia.**
1927	**December, Third Science Program, Nashville.**
1928	**December, Fourth National Meeting, Coat-of-Arms adopted, Fourth Science Program, New York.**
1930	**January, Council Meeting, Ritual Revised, Norman, Okla.** **December, Fifth National Meeting, Fifth Science Program, Cleveland.**
1931	**Phi Sigma Letters Registered, U. S. Patent Office.**
1932	**December, Sixth Science Program, Atlantic City.**
1933	**June, Sixth National Meeting, Seventh Science Program, Chicago.**
1935	**December, Seventh National Meeting, Eighth Science Program, St. Louis.**
1937	**December, Eighth National Meeting, Ninth Science Program, Indianapolis.**
1939	**December, Ninth National Meeting, Tenth Science Program, Silver Anniversary, Ohio State University, Columbus.**
1941	**December, Tenth National Meeting, Dallas, Texas.**
1946	**December, Eleventh National Meeting, Boston, Mass.**
1948	**December, Twelfth Meeting, Eleventh Science Program, Albuquerque, N. Mex.**
1950	**December, Thirteenth Meeting, Denver and Boulder, Colo.**
1952	**December, Fourteenth Meeting, St. Louis, Mo.**
1954	**September, Fifteenth Meeting, Gainesville, Fla.**

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